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No. 3—The Control of Mastitis in New York State*

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In accepting this invitation to present the subject of mastitis we assume your chief interest is in the work in New York State and this is what we shall attempt to describe. As in all dairy districts, mastitis with us has become a disease of primary importance and there have been urgent requests from farmers for relief from the losses that it incurs. We presume there are differences between the conditions in Great Britain and America, but there can be little difference in the underlying principles.

In New York state mastitis is important because of economic loss from diminished milk production, and because of rejection of cows by inspectors who pass upon their fitness to produce market milk under municipal or State sanitary codes. Under regulations of the New York City Board of Health, for example, an annual certificate of health must be obtained from a veterinarian for all cows producing milk for the city market, and in some of the adjacent cities in the Metropolitan Area, such as Newark, New Jersey, physical examinations twice yearly are required of producers of grade A milk. Similar regulations for other parts of the State are provided in the State Sanitary Code. In addition, the milk companies who purchase, pasteurize and distribute milk inspect the product from its source to its destination. When delivered at the collecting station from the farm it is examined for odour, admixtures, temperature and cell count. When abnormal conditions are found, such as pinpoint colonies on standard plate counts, or long-chained streptococci or leucocytes in smears of non-incubated milk from weigh-can samples, mastitis may be suspected. In herds producing certified milk monthly examinations are required, and quarterly examinations are made by certain companies that produce grade A pasteurized milk. Rejections under the New York City Regulations are said to run from one to five per cent. yearly. And there are many farmers outside inspection service whose operations are conducted at a loss because from 25 to 40 per cent. of their cows have chronic mastitis in an advanced form. Replacement of cows under the tuberculosis and abortion control programme has increased the sales of cattle, especially at auctions, and many cows rendered worthless for milk production because of chronic advanced inflammation of the udder have been included in the purchased additions. Even cows condemned because of mastitis have entered other herds after a long or short trip in a truck.

The result of this situation was an appropriation of $5,000.00 to the Veterinary College for a study of the problem: and because of opportunities for contact with many herds through the ambulatory clinic it came to the department of medicine. In 1929, one of us, Dr. S. D. Johnson, was assigned to this work. Our first effort was a clinical study of several large and small herds and a laboratory study of the milk, for purposes of information. We had no theories and no definite programme. In 1936, additional funds provided a second person, giving one for the laboratory and one for the field.

There was soon noted a close agreement of the decisions reached in the stable and in the laboratory, and also that two persons working independently would classify udders alike according to the fibrosis and atrophy. Since the degree of mastitis is so variable that the word used alone is indefinite, udders were classified, chiefly according to the degree of fibrosis, as numbers 1, 2, 3, and 4. Numbers 1 and 2 are excellent or normal; number 3, fair; and number 4, chronic advanced mastitis.

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Comparative laboratory examinations of the milk revealed almost no infection in class 1 and 2, a medium rate in class 3, and a high rate in class 4. The amount of infection was also found to be higher in class 4. It was concluded that these cows were the chief source of contagion and that their removal from contact with the herd would have a restraining influence upon the spread of the disease. In herds containing a high rate of advanced cases, infection is more widely distributed among the class 3 cows. These views have been supported by numerous observations which will be described.

Examinations in the stable apply to size of herd, age, quality of stables and attendants, care of animals, history with respect to mastitis, and whether additions are natural or by purchase. Examination of the individual cow includes appearance of the milk in test tubes, on the strip cup, on the bromthymol blue test for alkalinity, and occasionally on the field chlorine test. After milking, the udder and teats are examined for asymmetry and fibrosis, though in light producers previous milking may not be necessary. Examination of the stable refers to the length and width of the stall bed, partitions between cows, type of stanchions, bedding, use of lime or superphosphate on the back part of the stall beds, cleanliness, position of doors and other intakes near stanchions, and whether the yard is so muddy that the teats drag through filth. When milk is taken for laboratory examination, quarter samples of the first streams are drawn.

Cows under observation for purposes of study are examined according to the formula in Table I.

When few bacteria appear on a blood agar plate, it is recorded in small letters (strep) which indicates approximately 1,000 per c.c. When there are many, it is written in capitals (STREP), indicating 5,000 or more per c.c. A report of very many means 500,000 or more.

These observations give comprehensive information on the extent of the lesions, the degree of infection, and the character of the milk. In the interpretation of the results of examination of milk, one needs to consider its variations. In the first month of lactation, for example, and especially within the first two weeks, milk from a badly diseased udder of a heavy milker may be normal to all of the various tests, including the bacteriological, or it may be abnormal. Because of the number of tests that may be applied to milk a comparison of the relative value of such methods has become a popular study, and a tabulation of the results may be confusing. If the percentage of infection among cows reacting to a test is only 70, for example, this method alone will hardly indicate whether or not a reactor is in the 70 per cent. or the 30 per cent. group. The value of a diagnostic method is judged by what it tells about the patient under examination, and not by what it has told about the average.

Milk is examined on the strip cup, or on a black sheet of bakelite slanted into a baking tin, or in test tubes held to the light. Abnormalities vary from a slight watery appearance in the test tube, which is of slight significance, to that of flakes, clots, or pus of various amounts and consistency, which is highly important.

The *bromthymol blue test* is made after the first ten or twelve streams have been discarded. Reactions are read as light green, green, or dark green. An orange reaction results from increased acidity and it is only seen when added to milk that is obviously bad. With proper regard for the lactation period, reacting quarters are regarded as suspicious, and usually other evidence of mastitis is present, but no conclusion should be reached on this test alone. Milk may be alkaline when a non-infected quarter begins to dry off for no apparent reason, from a slight contusion, from a transient staphylococcus or other noncontagious infection, or from a case of *S. agalactiae* mastitis. Inspectors find it useful for the detection of cows that are drying off.

The *field test for chlorine* is thought by some to be too sensitive for practical use. When milk is entirely negative to this test, the udder

Table I

Third calf born September 5th, 1937. Examination, May 6th, 1938. Born March, 1933.

	LH.	LF.	RH	RF.
1. Milk	—	—	—	—
2. Bromthymol blue	—	green	—	green
3. Chlorine field test	+	+	+	+
4. Milk incubated 24 hours	—	FLAKES	—	SEDIMENT
5. Blood agar plates	staph	STREP*	coryn	STAPH
6. Smears, 24-hour incubation	staph	STREP	staph	STAPH
7. Cell count	1,600,000	4,300,000	320,000	XXXXa
8. Fibrosis	Distinct	Distinct	Slight	Distinct +b

**S. agalactiae*, weak beta ; a, too many to count ; b, class 3 udder.

is usually above suspicion. It is of value in the purchase of cows. Reactions occur early in the advanced lactation period.

Incubation of milk for 24 hours at 37° C., is a simple and useful method of testing milk from a suspected quarter. When certain types of deposits are formed, *S. agalactiae* is almost invariably present, Fig. 1.

A *high cell count* may rarely be in the millions and transient from no apparent cause, and it is normally high in late lactation. With proper regard for the lactation period, the cell count is highly useful in the determination of the presence and the extent of inflammation of the udder. It is high when cows rapidly decrease in milk flow from a disease, such as winter dysentery. Often it is especially high in mild transient or constant staphylococcus infections. The degree of mastitis and the prognosis may be judged somewhat according to whether the count is in the two millions, the five millions or the ten millions. There are individual exceptions, however, so that no definite number alone can be accepted as a diagnosis of mastitis.

Fig. 1.
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Bacterial examination of milk has been made, following methods in general use; these are described in the *Cornell Veterinarian* for July, 1938. Our observations agree with those commonly reported, that in badly diseased herds *S. agalactiae* is usually the predominant infection. Groups II and III, Minett, Stableforth and Edwards (*dysgalactiae* and *uberis* of Diernhofer), are recovered from nearly every herd, and, similar to staphylococcus infections, they appear to be noncontagious, rather transient and less pathogenic than *S. agalactiae* (Group I). But occasionally the infection is severe. Data from 18 herds and 648 cows are presented in Table II to illustrate variations in the distribution of infections.

Herd 1 was infected only with staphylococci; yet there were four cases of advanced clinical mastitis (class 4 udders). Milk from herds 2 to 8 yielded only Groups II and III streptococci, while milk from herds 9 to 18 yielded all three groups. In these herds the rate of infection with miscellaneous streptococci other than agalactiae is shown to be essentially the same whether or not agalactiae is present, and there is no essential difference between the rate of infection and the number of animals in the herd.

The effect of supervision upon different groups of streptococci in these herds is shown in Table III. (*over-leaf*).

Table III shows that the first effect of supervision was to reduce the rate of *S. agalactiae* infection, and that where the rate of *S. agalactiae* infection was high, the rate of miscellaneous streptococcic infection was relatively low--herds 10, 11, 13 and 18, Table II. Apparently a high rate of agalactiae infection

Table II

Herd.	Cows.	Infected Cows.	Distribution by Quarters.					
			Agalactiae Group I.	Dysgalactiae Group II.	Uberis Group III.	Other Streptococci.	Unidentified Streptococci.	Staphylococci.
1	16	8	0					16
2	17	1	0	1				
3	13	1	0	1				
4	29	3	0	1		1	1	
5	11	2	0		1		1	
6	20	3	0				4	
7	23	4	0		4	1		
8	9	1	0		2			
9	181	29	24	7	10	4		
10	25	6	6					
11	73	14	17				2	
12	131	22	39	2	3	3		
13	18	5	7					
14	19	6	2		4	2		
15	14	10	10	4	1		2	
16	9	7	9				2	
17	17	7	19			2		
18	23	17	27				3	

Table III

	Total cows	Infected cows	Per cent. infection	Size of herds
Groups II and III, herds 2 to 8, supervised	125	15	12	10–30
Groups I, II and III, herds 9, 11, 12, supervised	385	65	17	75–175
Groups I, II and III, all others unsupervised	125	58	46	9–25

either displaces or overwhelms other types. This suggestion arises when a quarter infected with staphylococci begins to yield streptococci, and when a quarter treated with trypaflavine for streptococcic infection, thereafter yields only staphylococci. In badly diseased herds the chances that an advanced clinical case of mastitis is caused by *S. agalactiae* are greater than if such an udder is identified in a relatively clean herd. In supervised herds, *S. agalactiae* is readily controlled; perhaps this is due to a restricted habitat in the udder. Often the rate of contagion is slow, and apparently the period of incubation may be long and uncertain. The Group II infections in herd 9 were chiefly in heifers and young cows.

We have no evidence that group 1 becomes permanently established in the stable, except in the udder. It is probable that milk from udders which discharge freely through a patent teat opening does contaminate the floor, and that *S. agalactiae* infection may survive here long enough to reach other easily infected quarters. It is doubtful, however, that such survival is permanent; it may be continuous if there are enough spreaders. Groups II and III, on the other hand, appear not to be restricted in their habitat, nor do they appear to spread by contact. This view is supported by the observation that they continue to be recovered from herds 2 to 8 regardless of strict sanitation, and that *S. agalactiae* is not recovered from the milk of these herds where sanitation is not observed. This view is further supported by the observation that *S. agalactiae* in each herd is distinctive for the herd, being non-haemolytic, green, narrow-zone haemolysis, or weak beta; one or the other of these types predominates.

In the diagnosis, identification on blood agar plates is highly desirable, and such information should be available to the veterinarian, who often needs to know whether a diseased udder harbours staphylococci only, or *S. agalactiae*. While he may determine this point for himself by means of smears of incubated milk, his conclusions are at least less authoritative and they may be less reliable. The course and prognosis vary with the type of infection; Groups II and III and staphylococci are sometimes transient or limited to a single lactation, and in the case of pure-bred animals this information may be of great value. Furthermore, complete information of a case adds to its interest and to the knowledge of the disease.

Physical examination of the milked-out udder for fibrosis, atrophy, or other changes, combined with examination of the milk for physical changes, alkalinity and possibly chlorides affords an accurate and practicable method of diagnosis. Reference has been made to the relation between the extent of the physical changes and the degree of infection. This relation may vary according to the percentage and intensity of infection in the herd, but in any case the method is adequate. Observations are first made for asymmetry, flaccid sphincters and patent teat openings. If milk flows on slight touch of the teat or quarter, infection is probably present, for it is impossible to avoid invasion of such quarters. The condition may be natural or acquired from injury. The teat is then palpated for lesions in the duct.

An outline of the method of observation and palpation of the udder is illustrated in Figures 1 to 8, plate I.

Fig. 1. Observe the rear quarters for the presence of atrophy.

Fig. 2. Observe the front quarters for atrophy.

Fig. 3. Palpation of cisterns. Raise the quarters together simultaneously to compare the consistency and weight by lightly raising and palpating the tissues in the region of the cisterns with the finger tips. There may be a distinct variation in the weight, firmness and surface which reveals fibrosis in one as compared with a normal soft glandular structure in the other. Variations here suggest the probable findings throughout the quarter.

Figs. 4 and 5. Method of locating circumscribed areas of fibrosis in the ventral part of the quarters. Grasp, but do not stretch, the teat with one hand and compress the tissues with the other. In a normal, elastic quarter the opposing thumb and fingers are separated chiefly by the opposing layers of skin. In fibrosis they are separated more or less by a firm mass. The degree of fibrosis is estimated by the difference between the two hind quarters and the two front quarters both anterior and posterior to the teats. But do not compare front quarters with hind quarters.

Fig. 6. Superficial palpation of the surface. With light compression the skin is raised in folds while the finger tips glide over the underlying surface to detect the degree of smoothness. The presence of distinct coarse lobulations indicates fibrosis.

Fig. 7. Grasp the quarter firmly with both hands, which are moved back and forth under

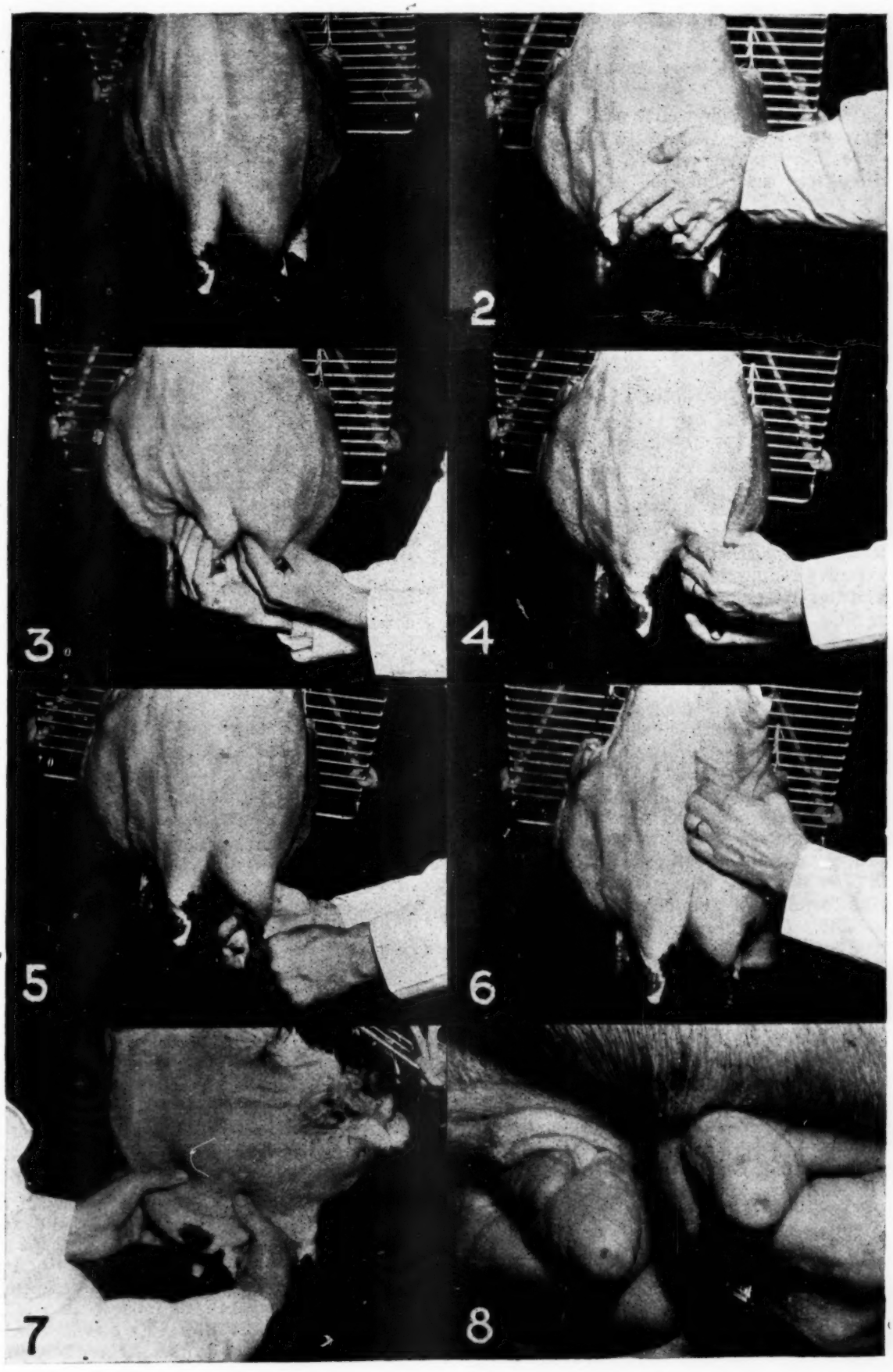

Plate 1.

firm compression to detect lobulations and consistency. The tissues are alternately compressed and relaxed. The degree of atrophy and consistency are also judged by lifting each quarter with both hands to compare the weight, elasticity, and size. Coarse, irregular lobulations are of greater significance than fine lobulations uniformly distributed.

Fig. 8. Examination of the ends of the teats for patent meatus, relaxed sphincter, and ease of milking.

The findings on each quarter are recorded as follows:—

—, the quarter is entirely normal.

S, fibrosis is slight or suspected. There are single indurations not more than one or two inches in diameter.

D, fibrosis is distinct; Da, with slight atrophy, DA, with marked atrophy; Da lob, with coarse lobulations; D+A lob E, very distinct with marked atrophy, coarse lobulations, and relaxed sphincter. There is multiple fibrosis or a single induration approximately two to three inches diameter.

M, fibrosis is marked. Disseminated or diffuse extensive indurations have largely replaced the glandular tissue.

The plus sign indicates an intermediate degree, as S+, D+. Udders of first-calf heifers are normally firm, and the individual quarters are sometimes marked *D*. With sufficient practice, one may be able to classify udders of dry cows. When the udder is congested, tense, and oedematous in relation to parturition, it is not suitable for examination. If an udder is oedematous, or "doughy," unrelated to parturition, it is severely judged.

Udders are classified as Numbers 1, 2, 3 and 4, according to the following specifications:—

No. 1. The udder is normal in every respect and is uniformly symmetrical.

No. 2. The milk production is normal in amount and quality. In a few the strip cup may occasionally show scattered pin-point flakes. The alkalinity is usually normal. Fibrotic lesions are few and slight or single and distinct. An udder with two distinct quarters, but otherwise normal, may be classified as 2+. Laboratory examination of milk from distinct quarters may reveal staphylococcus or other low grade infection with a cell count in the low millions.

No. 3. Production usually is normal. There may have been previous acute attacks. At times the milk may contain flakes or clots or appear watery. The alkalinity may be increased, especially at the beginning or the close of lactation; indurations are distinct in more than one quarter, or are distinct in one quarter in combination with a persistent bromthymol blue reaction. If a quarter constantly gives distinctly abnormal milk and shows infection the udder may be classed as 3+ or 4. Often there is a low grade infection and a high cell count.

No. 4. Production is below normal. Often there have been repeated acute attacks. Usually the milk contains flakes or clots and is watery. The alkalinity and chlorides are increased. Fibrosis is distinct and multiple or marked and diffuse. Atrophy and asymmetry are frequent. If the lesions are marked in two quarters the udder is classed as No. 4, even if the milk is temporarily normal. If a quarter leaks freely the udder is classed as No. 4. Laboratory examination reveals infection, and cells are present in the millions.

That spread by contact may be slow is shown by our small experimental herd where no precautions have been taken and no new case has developed in three years. It is a matter of observation, however, that occasionally infection may spread rapidly after the addition of a purchased cow. Whether this is due to an unusually virulent type of infection, or to a poorly fitting cup on the milking machine is not known. Probably there are variations in the virulence of different types or strains.

The care and feeding of the cows exerts an influence on the activity of the infection. If cows are fed lightly, the degree of infection revealed in the milk is low in comparison with the degree of fibrosis in the udders. Thus conservative feeding of mastitis cows improves the quality of milk and the performance of the unit.

While only slight reference has been made to the symptoms, it is important to consider that mastitis caused by Groups II and III streptococci and by staphylococci usually is of a lower grade than that caused by Group I streptococcus. In these low-grade infections recovery often occurs, and consequently one should be conservative in the prognosis of such cases.

Control

Bacteriological examination of the milk for *S. agalactiae* (Group I) has been regarded as an essential step in the control of mastitis. Our observations during the past nine years agree with the prevailing belief that usually in badly diseased herds this is the predominant cause. This appears to be true of any group of cows affected with fibrosis in an advanced form, whether they are individuals assembled from comparatively clean herds, or groups of cows found in badly diseased herds.

While bacteriological identification of the milk of cows harbouring *S. agalactiae* is regarded as desirable in the control of mastitis in a herd, it is not regarded as essential. By means of such examinations it is possible to identify and reject infected cows, as one rejects cows on the tuberculin test. But there are such essential differences in the habitat and virulence

of the organism, the channels of spread, the mode of infection, the degree of contagion and the relationship in general between the infective agent and the cow that methods essential to the control of other chronic diseases are not essential here. Observance of stable hygiene, for example, has little influence upon the spread of tuberculosis, but it has profound influence upon the spread of mastitis. In tuberculosis the most important factor is diagnosis, while in mastitis the most important influence is stable and milking hygiene. Mastitis is not caused by a specific infection, except in definitions which specify one of the various bacterial causes. Reports in Tables 2 and 3 suggest that *S. agalactiae* thrives in the neglected herd, where milking and udder sanitation are ignored, and where additions are largely by purchase; it is a result of poor sanitation. This is shown in some of our large commercial milking herds where the turnover because of mastitis is extremely high each year. As cows are commonly purchased, mastitis is nearly always included in the sale. Table 3 also shows that in the three herds of 75 to 175 cows each, where all three kinds of infection are found, and where control is practised, there is only a 17 per cent. infection in contrast to 12 per cent. in small herds from which *S. agalactiae* has either been eliminated, or was not found at the time of the original survey.

Removal of all cows yielding *S. agalactiae* involves an elaborate and expensive technique not generally available; it removes individuals from which the infection might disappear; there were six such individuals in herd 9, table 2; it imposes heavy cost by including many animals that are still high producers of milk of good quality; it discards cows that may be successfully treated; and it does not provide sanitary supervision.

It is highly desirable, however, that laboratory diagnosis be available to veterinarians engaged in mastitis control.

In general control the first requirements are good herd management and adequate sanitary supervision. The first step is to remove the advanced cases, which includes the class 3+ and 4 cows. In Table 2, herd 9, this would have removed one-third of the infected cows and 43 per cent. of the quarters showing streptococci on blood agar plates. In herd 15 it would have removed eight of the nine infected cows. Herd 18 was an exception to the rule, since the rate of infection was about equally distributed between the class 3 and 4 cows. Conditions are not alike in any two herds, and this is one reason why sanitary supervision needs to be in the charge of a trained veterinarian.

The following specific suggestions are given to the owner. Not all of these provisions are practicable in each herd. Measures that prove to be effective in one herd may not be sufficient in another, for the personal element is an important factor. Control is more readily accomplished in a privately owned herd than in an institutional herd, or where change of cows is frequent.

1. *Stanchion Classified Cows in their Respective Groups.*—The milking cows should be stanchioned and milked according to their classification in the following order: class 1 and 2 (clean group): class 3 (suspicious group); and class 3+ and 4 (badly infected group).

2. *Use the Strip Cup Before Milking.*—When a cow shows watery milk, flakes, clots or pus repeatedly she should be removed from the milking line, particularly if she stands in a clean group. Early discovery of cases showing watery milk or pin-point flakes in the milk may save a cow. In the treatment of such cases, the grain ration is reduced immediately, the affected quarter or quarters milked hourly, and hot epsom salts packs applied.

3. *Washing Udders.*—Except in a few isolated herds only one method of washing udders can be recommended. Individual towels should be supplied for each cow. The towels are placed in a chlorine solution of a strength of 200 parts per million (p.p.m.). When an udder is to be washed, the operator removes a towel from the pail and wrings it partly dry. After the udder is washed the towel is wrung dry, and the surface of the udder is wiped dry. The towel is dropped into a discard pail. The same operation is repeated for the next cow. All towels should be washed in a hot soap-suds water, wrung dry, and then placed in a chlorine solution (200 p.p.m.) in a crock until the next milking. The chlorine solution should be supplied fresh daily.

4. *Milking.*—It is advisable to assign a group of cows to each milker who milks them each time. Since it is important that complete milking be practised, the herdsman is expected to make personal examinations of milked cows frequently.

5. *Dipping Teats.*—Only a small amount of chlorine (half to one pint, having a strength of 200 p.p.m.) is necessary to dip the ends of the teats after milking. Dip the teats of 20 to 30 cows and discard the solution. Provide a basin constructed preferably of graniteware, porcelain, enamelware or glass and large enough to accommodate the four teats of an udder at one time.

6. *Washing Hands.*—Before milking each cow a milker should wash his hands with soap and water, disinfect them with a chlorine solution (100 to 200 p.p.m.) and wipe them dry, preferably with paper towels. Where milking machines are used, the milking cups should be dipped in water and then in a chlorine solution after each cow is milked.

7. *Do not milk on the floor.*

8. *Do not permit wet-hand milking.*

9. *Disinfection of the Stall Bed.*—Once a week, the litter should be removed, the surface of the platform scraped clean and sprayed with a disinfectant. One may use a 400 to 500 p.p.m. chlorine solution, or a 3 to 5 per cent. hot lye solution, or a 3 per cent. liquor cresolis compositus solution. In one herd this solution has been used twice daily.

10. *Provide an abundance of bedding.*

11. *Use of Lime or Calcium Superphosphate.*—Each day before it is swept the floor should be sprinkled with hydrated lime or superphosphate. Superphosphate may be sprinkled on the floor after sweeping.

12. *Heavy Producing Cows.*—Heavy producing cows of any breed will be less likely to develop mastitis and will produce more if milked three times a day.

13. *First-calf Heifers.*—The milk of first-calf heifers should be examined for mastitis at the beginning of the lactation period. When the milk of a heifer is normal on the strip cup and the bromthymol blue test, she may be stanchioned with the clean group and milked first.

14. *Fresh Cows.*—A strip-cup and bromthymol blue test can be run on each cow within three to four days after freshening. If the milk of a cow that was a member of the clean group during the previous lactation is abnormal on the strip cup, or gives a green reaction to the bromthymol blue test, this cow should be withheld from the clean group until she is declared free of mastitis. Such an animal often proves to be a class 3 (suspicious) cow.

15. *Purchased Additions.*—Before purchase each cow should be examined for mastitis or other diseases. A veterinary certificate of health should be required for each animal. As an additional precautionary measure, the purchaser should handle such an animal as potentially dangerous to his herd until it is definitely determined that no udder trouble exists.

16. *Raising Calves.*—Provide milk for young calves from disease-free cows. Do not allow calves to suck each other habitually.

17. *Stall-bed Construction.*—Provide an adequate stall-bed and partitions for each cow. Many injuries are caused by cows treading on each other's teats and udders because the stall beds are either too narrow or too short. Such injuries usually result in mastitis, and often in complete loss of the injured quarter.

Injuries to the teats and udder, and operations upon the teats, heal more readily in herds from which *S. agalactiae* infection has been eliminated or in which it has been reduced, than in badly diseased herds.

A detailed account has been given of methods of examination of herds for purposes of study. From these observations it was concluded that examinations made on the premises are adequate to meet the diagnostic requirements of control. Under this system the udders are classified upon evidence revealed by the strip cup, the bromthymol blue test, and the physical examination of the udder, chief reliance being placed upon the physical examination. This plan was greeted with considerable scepticism, but this attitude was met with a proposal to give public demonstrations in badly diseased herds. After waiting nearly two years the owner of such a herd volunteered it for the purpose in February, 1934. From this beginning we have in the past four years surveyed 60 herds including 2,500 cows. In support of the system the Farm Bureau organisation was successful in its request of the legislature that the appropriation for the work be doubled. In 1937, and again this year, we have given a short course on the subject to 20 veterinarians from Michigan, under the auspices of the Kellogg Foundation, in an effort to improve the quality of milk in certain counties in their welfare programme in that State.

Without further details on the favourable reception of this programme, one may claim that it has met the needs of the producer, the officials who administer municipal and State sanitary codes, the veterinarians who supervise the production of milk of high quality, and the consumer.

. . . . .

There was a very large assembly of members and visitors for the discussion of the foregoing paper at the session of Congress, N.V.M.A., held for the purpose in the Congress Hall of the Empire Exhibition, Glasgow, on the morning of Wednesday, September 7th, 1938, when the Chair was occupied by Captain J. R. Barker, M.R.C.V.S., D.V.M., of Hereford.

The CHAIRMAN: This morning Professor Udall, from Cornell University, is here to support the paper jointly prepared by himself and his co-workers in Cornell University. Dr. Udall may be said to be a unique personality in that he is a research worker, a teacher, and a practising clinician. That should commend him to the veterinary surgeons of Great Britain and Ireland. Professor Udall's position in the United States is that he is also Editor of the *Cornell Veterinarian* and the author of a book on Veterinary Medicine. That is rather appropriate for the work before us this morning. Without more ado, ladies and gentlemen, as time is short, I would introduce to you Professor Udall from Cornell University.

DR. UDALL'S INTRODUCTORY ADDRESS

Professor Udall (greeted with loud applause): I wish first to express my appreciation of the honour of the invitation to address this Congress.

As an introduction, I think I should define the subject. Different workers with different backgrounds of experience give us such wide variations in the definition of mastitis that the term taken by itself means very little. We define mastitis according to the principles of Virchow's cellular pathology. There is a change from glandular tissue to connective tissue; this is a chronic condition characterised by changes which may readily be detected by examination of the udder. Bacteriologically it is caused chiefly by *Streptococcus agalactiae*. There are also other streptococci which cause chronic mastitis that cannot be differentiated clinically from that caused by *S. agalactiae*. The disease is progressive through successive lactations; and while the progress is usually slow, it is subject from time to time to acute activity; this active period constitutes the "clinical mastitis" of many veterinarians. When this activity recedes it is judged that the case is cured. The udder is usually left, however, in its previous condition with somewhat less glandular tissue and somewhat more scar tissue. *S. agalactiae* is regarded as the only contagious organism. The other groups are regarded as sporadic, and that is our opinion, but our knowledge of this subject is incomplete. One who has worked with mastitis for 20 years said to me recently that he thought our knowledge of the subject is in its infancy, and so far as bacteriology is concerned I agree with him. The disease spreads by contact but we have incomplete information on its contagious character. In some herds it spreads rapidly and in many the extension is slow. Veterinarians engaged exclusively in dairy inspection work for our large milk companies report that in their supervised herds at least 80 to 85 per cent. of the new cases of mastitis are caused by injuries rather than by contagion. Thus the malady is similar to calf scours or calf pneumonia, which may be initiated by means of sporadic infection and then become contagious; one has to learn how to live with the infection and still avoid its attack.

With respect to the symptoms, our belief coincides with the general view that the condition is chronic, that it may be chronic from the beginning and remain so, or it may begin as an acute mastitis and thereafter remain chronic. Because of its insidious course and manner of onset, it has been termed by a number of writers as a sub-clinical disease, in contrast to acute mastitis, and one frequently hears the phrase that the treatment of mastitis is limited to the non-clinical case. We insist that the sub-clinical quality does not reside in the udder. Any veterinarian trained in the physical examination of the udder can readily recognise the clinical characteristics of the disease.

Our problem is somewhat different in one respect from yours, since in New York State and a large part of the United States tuberculosis is of historic importance only. It is so completely eradicated that we do not expect to encounter it, and we rarely do. Thirty years ago in the area covered by our ambulatory clinic, it was estimated that we had about 15 per cent. tuberculosis. I do not know that we have encountered a case in the last five years, and tuberculosis of the udder is practically unknown. Many of our herds are also free from Bang's disease.

The methods of control in New York State have been stimulated by the regulation of the New York City Board of Health. About 40 years ago, Claude Morris, Veterinarian for the Borden Farm Products Company, proposed that cows should receive a physical examination for their fitness to produce milk for human consumption, and this practice has become general for some of our large metropolitan markets. For a number of years it referred especially to tuberculosis of the lungs and udder. More recently there has been such an increase in the amount of mastitis and the amount of pus in the milk that chief importance now attaches to the udder. An examination is required at least once yearly by a veterinarian, who files a health certificate with the milk plant and leaves a copy with the owner. Because of condemnations, the farmers requested an appropriation from the legislature for research on mastitis in order that they might be relieved from some of the losses imposed by the disease. We now have a programme whereby a farmer may be assured of relief from these losses whenever he will meet its specifications; and this programme is in operation in thousands of herds.

Few udders are entirely free from fibrosis, but until this is somewhat advanced it does not affect the amount or quality of the milk. In advanced cases, both are affected, though the milk may be normal at some particular time. Milk from these cases is objected to by the New York City Board of Health, and udders affected with advanced fibrosis are readily detected by a veterinarian.

Our public demonstrations in diseased herds have demonstrated to the satisfaction of cattle owners that stanchioning of cows according to a clinical classification, combined with stable and milking hygiene, is an effective means of control. When this plan was first proposed, it met with rather general scepticism which is now chiefly prevalent only within certain groups

of our own profession. We have also examined many herds in consultation with veterinarians, who were unfamiliar with the work and not certain of their technique. Numerous all-day conferences have been held with small groups of veterinarians who examine cows together and compare their results. And finally, we examine about 200 herds yearly from the ambulatory clinic under Board of Health requirements. It has become a common practice for farmers to buy cows subject to a physical examination by a veterinarian, and in the examination of such cows the field chlorine test is especially useful. If a cow passes the chlorine test at an appropriate stage of lactation, it is highly probable that she is free from mastitis. In any examination of the milk one needs to consider its normal variations; these occur according to the period of lactation and according to other factors that we cannot determine. I have in mind a Friesian cow with a distinctly Class 4 udder, the milk of which had shown marked chemical and bacteriological changes on repeated examinations, yet two weeks after freshening the milk was normal to both chemical and bacteriological examinations.

In Table II are represented 18 herds. In the first herd only staphylococci were present, yet the udders were clinically affected and abnormal milk was often present. When turned out in a cold rain, acute flare-ups were common, and four advanced cases were found on clinical examination. The next eight herds are free from *S. agalactiae*, while in herds 9 to 18, agalactiae are present. When these herds came under supervision, *S. agalactiae* was the first to be eliminated; it appears to be less resistant than the others to stable and milking hygiene. It is our observation in herds where this species, *S. agalactiae*, has been eliminated that operations on the teats are more successful than where it is present. Where *S. agalactiae* is present, the tendency is for it to establish itself in the udder whenever the teat is injured.

We have said that on blood agar plates *S. agalactiae* in each herd is distinctive for the herd, being non-haemolytic, green, narrow zone haemolysis, or broad zone haemolysis; one or the other of these types predominates. We have recovered the green type from a number of herds where contagion has been rapid and destructive. Whether this was due to a high virulence of infection of the green type remains undetermined.

[Professor Udall proceeded to explain various points indicated by lantern slides which were shown to the members at this stage.

In conclusion, he gave a practical demonstration of the various methods of manual examination of the udder.]

Discussion

Mr. W. Nairn, M.R.C.V.S. (Blairgowrie): At a time when British cheesemakers are worried with their difficulties in manufacturing their product it is a great privilege to have the views of an American authority of Professor Udall's standing.

Mastitis due to the *Streptococcus agalactiae*, in addition to its interference with good cheesemaking, increases the losses of farmers by the earlier wastage of their cows and in addition reduces the quality of milk to the consumer.

There are other forms of mastitis more destructive to the mammary gland than that due to the *Streptococcus agalactiae*; some are even fatal, but they are not included in Professor Udall's paper. The therapeutics of these infective conditions has never been very satisfactory so we are compelled to direct our attention to the prophylaxis. It would be interesting to British veterinarians to learn what methods are adopted in America to prevent such conditions as the so-called "summer mastitis" due largely to the *Bacillus pyogenes*. The elimination of tuberculosis from the cattle of America gives the veterinarian a considerable advantage in the examination of indurated udders, as I do not consider it possible for anyone definitely to determine the cause by manipulative means alone.

The control of mastitis involves the consideration of much laboratory technique and I am fortunate in having associated with me to-day, Mr. Edwards, who will I am sure deal adequately with that aspect of the discussion.

Professor Udall, I gather from his paper, claims that it is possible by field tests and manipulative examination of the gland to determine whether it is affected and if so, to group it according to its possible infectivity. It will certainly be interesting to hear Mr. Edwards' views on this question, but I feel certain practitioners will receive much encouragement from such possibility, as we have regarded laboratory control to be essential in any such effort. I admire the system of grouping described in the paper and may say I had an opportunity four years ago of checking with Professor Udall at Cornell, the clinical condition with the laboratory reports, and it worked out as has been stated in the paper.

With his diagnostic methods one cannot disagree, but I should like him to tell us if fresh centres of infection occur frequently in his animals believed to be classified as non-infective, that is in groups one and two.

I do not think it is claimed by workers in this disease that laboratory diagnoses are 100 per cent. reliable, as a milk may be negative at one examination and later positive. Laboratory checking of herds indicates that it is possible

for recovery in the early stages of infection to take place, at least the milk becomes free of streptococci and this is not always due to the complete atrophy of an infective quarter.

Professor Udall has limited his control of mastitis to what might be termed segregation combined with the observance of good sanitary management of the herd, but he makes no reference to other therapeutic measures designed to clear up or reduce infection in the positive udders. May I ask if this is due to a lack of faith in these remedies owing to their erratic or negative results in his hands. If it should be, I must say that I have much sympathy with that attitude, for although we find in veterinary literature many remedies recommended, none in the course of years have established themselves in the practitioner's confidence.

Irrigation of the affected udder in chronic mastitis has frequently been recommended, and several of the flavine group have been used for this purpose, yet the benefit of them is still doubtful and far from 100 per cent. Much of their success might be ascribed to the better sanitary care of the animals. I have known of cases where fatalities have occurred a few days after irrigation and that in spite of the observance of good technique. Might I ask if udder irrigation is much practised in America, and what value is attached to it, for, while on occasion when used here, it has appeared to clear up an infected gland, in other cases it has served no useful purpose. The fact that some animals appear to overcome their infection without treatment makes it difficult to assess the value of this treatment. Using it in acute mastitis, I must say that I have noticed little or no benefit from the practice.

The streptococcal infections in human and veterinary medicine have not yielded readily to biological remedies and until recently we had no chemical substances which could be said to satisfy critical tests.

Veterinary literature can show many records of remedies for mastitis but they have not enjoyed long life as a rule, and the apparent success in the case of many of them was due to the fact that they were applied to the acute type of case which we know is likely to show more signs of improvement in its normal course, than we find in the chronic type.

Recently some new interest has been aroused by the successful results of the sulphanilamide group in streptococcal infections in human medicine and also in some veterinary cases, but the type of case which has yielded the most striking results has been the septicaemic, whereas when we apply them to a condition where the infection is localised to the secretory membrane of the udder it raises some doubt as to their possible efficacy. Then in human medicine the dosage has to be pushed to the limit of tolerance usually and this requires very careful administration. In veterinary medicine we cannot maintain that careful observation of danger signs and consequently we will take great risk with these substances, and in my experience there is a real danger in pushing the dose to high levels. I have tested these remedies in a number of acute cases of mastitis but am still unconvinced that they altered the course of the disease and were worth their cost. Shortly, I believe, some controlled tests are to be initiated with a view to the assessment of the therapeutic value of the sulphanilamides in mastitis and these will probably clear up the position. Can Professor Udall give us the benefit of his experience in the treatment of mastitis with these new remedies?

The system of control, practised by Professor Udall, wherein he classified his cows on the evidence of induration or lack of it and by the use of the strip-cup and the brom-thymol test, has apparently satisfied him that it is a sound method and it is certainly one within the facilities of practitioners. Hitherto we have regarded successful efforts as entirely dependent on careful laboratory examination of the milk from each cow. How many years might it take to eliminate entirely the chronic type of mastitis by his method? If unduly long, I fear it would not appeal to British farmers.

I notice Professor Udall uses chlorine as his disinfectant, but many farmers in this country fear using anything with the slightest odour. In America I believe all the milk is pasteurized so that the slight odour of chlorine would disappear. If free from any odour chlorine would have advantages compared with the common disinfectant used here, *viz.*, permanganate of potash.

In paragraph nine of his recommendations, we find it stated that the floor of the stalls should be thoroughly cleansed and disinfected once a week, whereas we believe in having the stall washed out daily. If it is impossible to wash it out thoroughly each day then it would certainly be advantageous to keep it dry with some such dressing as he mentions.

In paragraph six, Professor Udall recommends that before milking each cow, the milker should wash and disinfect his hands but in paragraph two, when he refers to the use of the strip-cup, he does not mention anything about the cleansing of the hands between each stripping. I fear the man with the strip-cup is just as dangerous as the milker, and there is one suggestion I would make here, *viz.*, that very strict care should be given to the personal hygiene of the dairy attendants. I had on one occasion the chance of seeing how a well-organised unit could break down in an important part of its organisation. The attendant with the strip-cup before he commenced carelessly wiped his nose

with his thumb and forefinger, and then started on his round. It is known that certain people may on occasion carry in their throat and nose the haemolytic type of organism, so it can be seen that this carelessness is not without danger. Every worker in a dairy should be provided with a fresh clean handkerchief at each milking and compelled to use it.

I agree with Professor Udall that, while his methods of control may reduce the work of the laboratory, every practitioner in dairying districts should have free access to one, so that he may more completely control his labours.

Would the essayist tell us why, in paragraph 16, he recommends that the milk fed to calves should be from mastitis-free cows? I have frequently thought that two calves suckled on a cow affected with chronic mastitis was an excellent way of reducing the induration, and I never saw any bad effects on the calves.

In this country we pay a bonus to the farmer for his milk from tuberculin-tested cows and I have little doubt another bonus will be required before the men in the retail milk trade will trouble with eradication. The cheese manufacturer will be only too glad to try any measure of control. May I ask if any bonus is paid in the States?

I consider Professor Udall's paper is presented at a most opportune moment in this country: we are much indebted to him for his kindness in coming here to-day. (Hear, hear.) Any remarks I have made are submitted solely with the desire to tempt Professor Udall to expand his very excellent contribution on this important question. (Applause.)

Mr. S. J. Edwards, M.Sc., M.R.C.V.S. (Ayr): In the first place I would like to thank Dr. Udall for having presented a paper on a subject which must be of great interest to everybody present. As in New York State so in this country mastitis is a disease of primary economic importance to the dairy farmer because of the wastage it causes amongst dairy cows. Further losses may result from the adverse effect of abnormal milk on the manufacture of milk products such as cheese. Consequently, any campaign to eradicate the disease would be of immense benefit to the dairy industry as a whole.

Dr. Udall is to be congratulated upon initiating a scheme of control and defining standards for this purpose in New York State. The scheme needs to be closely viewed in relation to our legislation under the Milk (Special Designations) Order of 1936, while remembering that it is limited to the control of mastitis in herds which are free from tuberculosis.

In the first place, the scheme of control recommended has to be considered in the light of what it purposes to achieve for the manufacturer and consumer in an effort to improve the quality of the milk supply. Milk is liable to be rejected at distributing centres and creameries in this country for one of three defects—(1) because it has an abnormal smell or taste; (2) because it reacts abnormally to some control test, such as the test for bacterial count or acidity; or (3) because it is supposed to interfere with the successful manufacture of milk products. In addition to these possible defects objection by the consumer to the inclusion of mastitis milk can be made on purely aesthetic grounds. The last and most serious objection can be made on public health grounds when the milk is found to be responsible for some epidemic disease affecting man. One knows, of course, that this can only be remedied by a thorough bacteriological examination of the milk of each cow in the herd in order to discover the source of contamination.

With regard to the elimination of the first-mentioned defects, however, I would like to ask Dr. Udall if he is satisfied that the measures adopted by him for the control of mastitis are effective in this respect. My own view is that the relationship of mastitis in the dairy cow to each of these defects requires investigation and that other factors in the production and handling of milk after it leaves the cow must be borne in mind.

Dr. Udall has described various methods that may be applied for the detection of mastitis and states that physical examination of the milked out udder for fibrosis, etc., combined with the examination of the milk for physical changes by chemical tests forms an accurate and practical method of diagnosis. He attaches special importance to clinical examination of the udder for fibrosis. For improving the quality of the bulked product of the farm by the detection of cows giving abnormal milk I agree that these measures should be effective, but for controlling the disease within the herd these measures would not appear to me to be adequate.

The success of routine clinical examination in improving the quality of the milk lies in the frequency with which this examination can be carried out. Therefore, it is essential that the methods adopted should be as simple as possible so that they can be carried out expeditiously and can be repeated at frequent intervals. For this purpose an examination of the milk of each cow for gross abnormality should be sufficient. The application of one simple test should, moreover, enable some standard of uniformity to be set up such as cannot be obtained when a number of tests are applied. By examining the fore-milk of each quarter in a shallow plate with blackened surface the presence of small clots can be detected and such milk should not be allowed to be included in the bulk supply of the farm until it is normal. This test for gross abnormality might also be carried out in conjunction with the reaction test by drawing a jet

of fore milk through muslin discs impregnated with indicator. The reaction test alone cannot be recommended for the detection of abnormality because a positive result does not necessarily indicate infection of the udder. A simple test such as I have described, therefore, achieves the object in view, at least for the time being.

The difficulty now arises regarding the grounds on which one can order the removal from the herd of animals giving abnormal milk. One knows that the course of mastitis changes from day to day and for this reason it is not possible to give a definite general prognosis. For instance, in cases of the prevailing type of mastitis, namely chronic mastitis, abnormal milk may be present for a few days in one or more quarters but complete recovery can take place. If clinical examination would enable an inspector to be more certain of the prognosis of affected animals then such an examination would be of great assistance; for instance, if abnormal milk was likely to be secreted for some time from an udder which could be classified as Class 3 or Class 4 according to Dr. Udall's classification, it would seem reasonable to remove such an animal from the herd. But in my opinion we would not feel justified on all occasions in condemning a cow because the udder on clinical examination belonged to either Class 3 or 4. It is quite possible for a cow during one lactation to be affected with chronic mastitis to such a degree that the udder falls definitely within one of these classes and yet her subsequent lactation may be normal in yield, character of the milk and consistency of the udder. To illustrate this point I will describe the clinical course of chronic mastitis and its effect on the milk yield of one cow:—

1st lactation—1,374 gall. in 48 weeks.

2nd lactation—776 gall. in 35 weeks. Started lactation with daily yield of 6 gall. but at the fourth month became affected with *Str. agalactiae* mastitis in the two hind quarters; yield fell to 1½ gall. per day. The affected quarters were markedly indurated, the milk was abnormal and on clinical grounds the udder of this cow would fall into Udall's Class 3 during the greater part of this lactation.

3rd lactation—following abortion. 710 gall. in 42 weeks. Highest peak 4 gall. per day. No fibrosis present in the udder; milk normal in appearance although streptococci could be recovered.

4th lactation—1,179 gall. in 50 weeks; highest peak 6·9 gall. per day. No abnormality in udder or in milk—infection absent during whole lactation.

5th lactation—8½ gall. per day.

Record to date: over 1,000 gall.

As Dr. Udall has himself said, there are various forms of mastitis and the course of the disease and the reaction of the udder is dependent on the nature of the invading organism. For example, in a typical Group II streptococcus infection the prominent clinical symptoms are marked induration of the infected quarter and abnormality of the milk. (I disagree here with Dr. Udall, who states that Group II infection usually produces a low-grade disease.) Such a quarter during the acute stages of the disease would be classified as Class 3 and for this reason would be rejected by Dr. Udall. Yet one knows that many of these cases recover and almost complete resolution of the udder tissues may take place. In the prognosis of acute affections of the udder one must be guided by a knowledge of the organism responsible for the condition.

In recommending, therefore, the disposal of infected animals consideration must be given principally to the history, number of quarters infected, age, and whether the milk yield has been uneconomic for some time.

Regarding the control of mastitis within the herd the view taken by Dr. Udall that the disease can be controlled by the measures recommended by him and that bacteriological examination of milk for the presence of specific infection is not necessary, differs from that which is now widely accepted by those who are giving their attention to the control of this disease.

It would appear to me that the recommendations made by Dr. Udall attain the same objective for mastitis as the Tuberculosis Order of 1925 does for tuberculosis. He has pointed out the essential differences in the control of tuberculosis and mastitis and there is no doubt that there are such differences in the methods of transmission, but the fundamental principle in their control is similar, namely, the diagnosis of latent infections.

In the first place, it should be pointed out that so far only one kind of udder disease has been controlled successfully and that is chronic contagious mastitis due to Group I streptococci. During extensive studies on this condition it has been realised that a large proportion of infected animals are affected in the latent stage and that one of the main problems in its control is the detection of these animals. Such animals must be considered to be potential sources of spread and I disagree with Dr. Udall who states that animals with udders in Class 4 are the chief source of infection.

The detection of "carrier" animals is made by the application of bacteriological tests or of chemical tests to the milk. During recent years considerable attention has been given to a comparison of the value of these tests in the diagnosis of latent infections and it is now generally agreed that an accurate bacteriological test only is reliable. After the diagnosis of latent infections has been made it is not necessary nor practical that all such animals should be removed from the

herd but they should certainly be segregated from the clean stock and milked last. Many of these early cases respond to treatment with some therapeutic agent such as acriflavine. Strict segregation should certainly be supplemented by the hygienic measures recommended by Dr. Udall. Hygienic measures alone, however, would not appear to me to be sufficient to control the disease because I have been in contact with herds where these measures are reasonably good yet chronic mastitis is prevalent.

In conclusion, I would like to express my appreciation again to Dr. Udall for his valuable paper. Such criticisms as I have made have been on the methods of diagnosis advocated by him but I admire his enthusiasm in having brought the control of mastitis within the sphere of State legislation.

[There being no general discussion, the Chairman called upon Dr. Udall to reply.]

The Reply

Dr. Udall, replying to the points raised in the discussion, said that, to deal first with the matter raised by Mr. Nairn with regard to tuberculosis, he wished to say that, when a physical examination of cows for their fitness to produce milk for New York City areas was first started, tuberculosis was a disease of considerable importance, and tuberculosis of the udder was included in the scope of this physical examination. He agreed with Mr. Nairn that on palpation of the udder alone one was not always able to say that the udder was or was not tuberculous, but in cases of doubt examination of the milk would usually answer the question. In cases of marked changes in both the milk and the udder, the question was settled irrespective of whether it was tuberculosis or not.

Concerning chemotherapy, he reported that they had been too actively engaged in a programme of prevention to study the problem of treatment. In the past eight months, however, a number of cases had been treated with trypaflavine solution and the results were encouraging, but it would require from three to five years to determine its real value. He did not think it would be of service in their No. 2 cows, because the percentage of infected udders in this group was very low and slight infections sometimes disappeared without any treatment. He was sure no useful purpose would be served by treating Class 4 udders. The results of treatment of Class 3 udders were suggestive of benefit. In some cases the milk was free from infection for a considerable time after injection, but in subsequent lactation periods the infection reappeared.

Mr. Nairn had spoken of odour associated with the use of hypochlorite solution in the disinfection of teats, and the danger that it might be conveyed in the milk. They had not heard of any complaint from the use of chlorine, which was used extensively in certified herds from which the milk was sold raw. The udders were washed with chlorine solution before milking and the teats were dipped in chlorine after milking. In one large herd producing certified milk the back part of the stall bed was sprayed twice daily before milking with a 3 per cent. solution of lysol; this had an odour which one would expect to be more objectionable than that of chlorine, still there had been no complaint.

In regard to washing the floor once a week, they thought washing was desirable and in many stables the floor was washed daily. But in a large area embracing many small stables where ordinary milk was produced, it was not always practicable to wash the floor daily. A reasonable amount of cleanliness, and the use of sufficient bedding made it possible for these herds to produce clean milk. In cold winter weather, in the average stable, there might be a disadvantage in washing the floor daily.

As far as dust was concerned, in the use of lime and similar preparations on the floor, most of the dust particles were from the cows, and if the cow's flanks were clean and the milk drawn into a narrow-top pail, there was little opportunity for superphosphate to find its way into the pail from the floor. The strip-cup was best used by the milker at each milking; improper use of the method was not the fault of the strip-cup.

Concerning the hygiene of the individual milker, it was well known that human infections harboured by the cow might be conveyed to the human in the milk; this had been frequently reported in the case of septic sore throat. In a small city near Ithaca a cow was sold because of mastitis from a herd under the regulations of the New York City Board of Health. This cow entered a herd where inspection was not enforced, the milk was distributed raw, and within a few days 400 families were quarantined.

Recommendation not to feed calves on grossly affected mastitis milk was based on the observation that mastitis in first-calf heifers occurs largely in herds where such feeding was practised. Their advice was based only on this observation and not upon proof that ingested infection finally reaches the udder. Mastitis in first-calf heifers was rather infrequent in herds reasonably free from disease of the udder.

Outbreaks of chronic mastitis did not occur under this system, though individual animals might become infected. Flare-ups of acute activity were frequent where the percentage of chronic mastitis was high. One of the most common sources of new infection was from the purchase of diseased cows.

How was the farmer encouraged to take interest in this work? In reply, reference was made to a herd of 35 cows where the milk and fat production were highly unsatisfactory because of mastitis and where nearly all of the first-calf heifers were also diseased. In the year preceding the survey acute symptoms had developed at one time or another in 50 per cent. of the cows. This herd was submitted for public demonstration of the mastitis control programme and at the end of two years the production had doubled. Many farmers were induced to practice control methods on the assurance that it would conserve cows and increase production. For a brief period the Federal Government paid indemnity on cows affected with chronic mastitis in an advanced form.

In regard to the discussion by Mr. Edwards, the latter had asked if mastitis controlled by the method of which he had spoken had remedied the defects of milk in regard to odour, quality, etc. He replied that mastitis control did improve the quality of milk, and that reports from numerous collecting stations presented evidence of freedom of the milk from pus. This was especially true of grade "A" milk, which was produced from cows examined four times a year.

Mr. Edwards had stated that while the method might be adequate for the control of the milk in the herd, it was not adequate for the control of the disease. He (Dr. Udall) was unable to comprehend a mastitis control programme which was adequate for the milk but not adequate for the disease. He disagreed emphatically with Mr. Edwards' view, as Mr. Edwards disagreed with his, but he was perfectly willing to leave the decision to those who had adopted the plan rather than leave it to those who had passed an opinion on the method and had never tried it.

The statement that mastitis changed from day to day was only a half truth; in general the fibrosis was chronic and progressed from month to month. If it was sufficiently advanced to justify a number 4 classification, the milk during most of the lactation period would be of poor quality even though it might be normal on some particular day. Whether or not the physical condition improved was of no significance in relation to the plan. Condemnation and disposal had never been a condition of the programme. The farmer was allowed to keep advanced cases if he so desired and could find a market for his milk. They only asked that cows of the same class be stanchioned together and that the diseased animals be milked last or by a separate milker; they might even occupy the same stable.

Group II streptococci (*S. dysgalactiae*) caused acute mastitis. When Group II streptococci were often found in the milk from udders affected with acute mastitis, especially those caused by injury, they were frequently found to be the cause of chronic mastitis as identified in routine examinations. He was in agreement with the statement that the infection tended to disappear, and mentioned the need for positive bacteriological identification before final judgment was passed.

Mr. Edwards had expressed strong disagreement with his statement that the advanced cases of mastitis were the ones which were chiefly contagious, rather than the less advanced forms where the inflammation tended to be low-grade in character. He too would have disagreed with that statement three or four years previous, but as a result of observations on many herds it was now believed that if these advanced cases were removed, it would remove a large percentage of the infection. If hygienic methods of stabling and milking were then applied, the infection would gradually be brought under control. That was the principle on which they were working at the present time and it appeared to be effective.

Continuing, Dr. Udall gave particulars of a report on approximately 2,500 herds and 50,000 cows examined quarterly for the production of special grade "A" milk. In 1936 there was an increase of 468·4 pounds per cow per year over the 1935 production. In 1937 there was an increase of 141·7 pounds of milk per cow over that of 1936, or a total of 610·1 pounds of milk per cow. This marked improvement was attributed to the adoption of mastitis control methods.

In reply to a question on hand and machine milking, Dr. Udall replied that, other things being equal, hand milking was preferred. If the machine was properly cared for and the milking cups dipped into chlorine solution after each cow had been milked, thus removing the danger of infection being carried from cow to cow, one could use the milking machine with success in herds that were reasonably free from mastitis.

The Chairman said that on their behalf he desired to propose a very hearty vote of thanks to Professor Udall for coming such a long distance and giving them the best that was in him, as he had done that day. (Applause.) He had omitted to say, in introducing Professor Udall, one or two things that might help them to frame their views of the material he had put forward. In the first place he understood that at the last International Veterinary Congress (held in U.S.A.) there was a surplus of funds, and that surplus of funds was invested, and the interest was given as a prize to the veterinarian who had done most for the veterinary profession in America.

The first prize was given to Professor Udall, and largely as a result of the public interest

in the mastitis eradication plan. The University in his own State where he was born granted him a doctorate of Science *honoris causa* for this particular work. (Applause.) That would perhaps meet some of the criticisms that had been put forward as to whether his scheme was of any use to the U.S.A. (Hear, hear.) With those few remarks, he asked them to accord to Dr. Udall and the openers of the discussion, Mr. Nairn and Mr. Edwards, their best thanks. (Applause.)

Dr. Udall, who was again acclaimed on rising to acknowledge the compliment, said that, in the nature of reply, his own statement would be one that he made at the beginning, that it was a great satisfaction and source of pride to him to be invited to address their Association at that Congress, and he could only repeat that sentiment.

EXPERIMENTS ON ANIMALS IN 1937

"The recently issued Home Office return* relating to experiments on living animals records an increase in the number of experiments performed. The total figure for 1937 was 918,960, including 40,319 experiments carried out with anaesthetics, and 878,641 experiments comprising inoculations, hypodermic injections, feeding experiments, and other proceedings performed without anaesthetics. The return states that in no case was a certificate dispensing entirely with the use of anaesthetics allowed for any operation more severe than subcutaneous venesection. Serious operations are always required to be performed under an anaesthetic. A condition attached to all licences was that if an animals was found to be suffering from severe pain which was likely to endure it should be painlessly killed. Except in certain experiments dealing with the efficiency of antiseptics the regulations demand the use of full antiseptic precautions, in order that wounds may heal as painlessly as possible. During the year 37 licensees performed 35,008 experiments in the course of cancer investigation; 3,290 of these were operations requiring anaesthetics; the remainder were almost entirely inoculations into mice or exposure of animals to radiations. Three hundred and twenty-two licensees performed over 179,000 experiments for Government Departments and other public bodies. In addition, more than 346,000 experiments were carried out in the course of the preparation and testing of antitoxic sera and vaccines and for the testing and standardising of drugs. The inspectors made 901 visits to registered places during the year, in most cases without previous notice, and witnessed a number of experiments. Only seven cases of irregularity were reported, none of them serious; the offenders were admonished. The Advisory Committee appointed to assist the Home Secretary with advice in the administration of the Act consisted of Lord Atkin (Chairman), Dr. H. Morley Fletcher, Sir Farquhar Buzzard, Mr. W. Sampson Handley, Sir D'Arcy Power, Mr. Wilfred Trotter, and Sir John Herbert Parsons."—*British Medical Journal.*

**Experiments on Living Animals, 1937.* H.M. Stationery Office; 1s.

The Importance of the Veterinarian in Animal Husbandry and in the Production of Foods of Animal Origin*

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One hundred and seventy-five years have passed since Bourgelat founded in Lyons, and three years later at Alfort, the first veterinary educational establishments and the veterinary art, until then almost entirely undeveloped, was provided for in France. This example was soon followed by all countries, and to-day veterinary colleges and faculties are found in almost every civilised State. Veterinary medicine has also been introduced as one of the subjects of scientific study at the universities, but even so there is widespread obscurity and ignorance concerning the nature of veterinary medicine and the importance of the tasks and functions of the veterinarian. Many fail to realise the part devolving upon the veterinarian in promoting activities of great benefit to human economy and to the State and public well-being; moreover, it is not generally recognised that he is the guardian, not only of the health of animals, but also of the health of human beings.

Many think that the veterinarian's only work is the treatment of sick animals, and yet a glance at the syllabus of studies at any veterinary college or faculty shows that veterinary students must undergo tuition in veterinary State service, inspection of slaughter animals and meat, veterinary dietetics, the production, hygiene and economics of milk, general animal husbandry, special animal husbandry (breeding of horses, cattle, etc.), in addition to nutrition, agriculture and animal housing. During the period of study students also undertake special courses in the judging of animals from the practical breeder's standpoint, also in nutrition, meat and milk examination and veterinary feeding stuffs.

Instruction in these special studies is indispensable. In nearly all countries laws and ordinances have been enacted for the control of epizoötic diseases, the examination of slaughter animals and meat, the supervision of food stuffs, especially milk, animal breeding and housing, disposal of carcases and warranty

*Translated from a paper presented at the Thirteenth International Veterinary Congress, held at Zürich and Interlaken, August, 1938.

in the sale of animals. It will be seen, therefore, that there is an abundance of laws, all of which demand the co-operation of the veterinarian and which concern not only the stock owner but also the general public and, to a far-reaching extent, the public health.

The importance of the veterinarian in the breeding and maintenance of animals and in the production of food stuffs is depicted in the following remarks.

(*a*) The Veterinarian's Importance in the Rearing and Maintenance of Animals

The value lying in animal holdings and the value of animal products are very great in all countries and the breeding of animals is of the utmost importance in the feeding of the people. In fact this can scarcely be over-estimated.

The figures published by the International Institute of Agriculture in Rome give:—

World Population in Million Head.

	Horses	Mules & Asses	Cattle	Pigs	Sheep	Goats
Europe	39·8	7·0	171·4	114·0	173·3	69·6
America	37·1	15·0	192·1	86·3	152·0	29·5
Asia ...	7·7	4·9	185·8	18·8	63·5	66·3
Africa	2·0	5·7	54·3	2·9	83·9	51·0
Australia	2·0	0·02	18·5	2·0	142·8	0·2
Total	88·6	32·62	622·1	224·0	615·5	216·6

Grand total: One thousand eight hundred million head.

The value of animals products in Germany has been estimated, in million *Reichsmarks*, to be:—

	1935-36	1936-37
Cattle	3,372	3,356
Calves	356	348
Pigs	2,464	2,588
Sheep	110	127
Goats	130	133
Poultry	565	620
Total animal products:	6,997	7,172
*As against agricultural products	4,565	4,678

*The disparity between the values of the livestock output and the other outputs of agriculture in Great Britain is even much greater: "The predominant occupation of British agriculture is the production of livestock. According to recent statistics, livestock and livestock products account for roughly two-thirds of the total estimated value of the agricultural output of England and Wales. The figures for Scotland are even higher, such products constituting over four-fifths of the country's agricultural output. Again, it has been estimated that more than 85 per cent. of the total agricultural area of Great Britain is used for grazing or for the production of crops which are utilised for stock feeding." Wright, N. C. (1938.) The Importance of Home-produced Feeding Stuffs. *Trans. Highland and Agric. Soc. Scotland.* **50**. 1.

It is principally for the public welfare and for human nutritional reasons that States have promoted animal breeding and regulated the multiplication and improvement of animals and the increase in their yields. The measures employed by governments for this purpose are well known. These operate partly indirectly and partly directly and are associated with semi-State and private arrangements.

The direct measures include toll barriers for animals and animal products, restrictions on importation, teaching and research stations, stock insurance and protection against contagious disease. The importance of legislation governing contagious diseases is generally recognised. The great losses which may be caused by allowing contagious diseases to run rife are well known, and it is also realised that by control by means of veterinary police regulations contagious diseases can be checked and even in some cases eradicated. Thus through systematic control, a mastery has been obtained over contagious diseases which caused grave losses only a few decades ago. In West, North and Central Europe rinderpest, contagious bovine pleuro-pneumonia, equine glanders and rabies have almost disappeared or are restricted to small centres. Combat has been waged against the other epizoötics mentioned in legislation, with the result at least that the usual diseases which were widely prevalent formerly have been brought under check.

Unfortunately in recent times, especially among cattle, infectious diseases have arisen which were little known formerly and which never were so widely prevalent as to-day, for example, tuberculosis, streptococcal mastitis, brucellosis and the various diseases designated collectively as breeding diseases. There is everywhere, however, authoritative and successful intervention by the veterinarian. At the colleges and at independent institutes specialists have given special attention to further research into the origin and course of the above diseases and also to production and discovery of therapeutic or preventive materials. Both official and private practitioners help to enlighten the breeder and to devise preventive measures. In this they achieve a very useful purpose. The majority of breeders and stock-owners need instruction because they do not know the mode of transmission of diseases and often do not understand the measures undertaken for control and thereby assist in bringing about the onset and further spread of diseases. Veterinary specialisation as well as veterinary research and studies provide, through systematic control of contagious diseases, great support to animal breeding and management in all countries. The names of great veterinarians such as Bang, Bourgelat, Dammann, Fröhner, Gerlach, Leclainche, von Ostertag, Schütz,

Theiler and others have therefore merited as much appreciation from agriculture as from the veterinary profession.

However, not only in civilised countries, but also in more backward territories (certain Colonies), animal breeding has proved to be successful only when under constant veterinary supervision, when widespread veterinary police frontier protection is undertaken and when, in the interior of the colony, control of contagious diseases is applied by means of modern therapy through veterinarians. Only they can successfully combat rinderpest, East Coast fever, Texas fever, surra, and other protozoal diseases and thereby maintain the animal wealth and the well-being of the colony and its inhabitants.

The results of control of contagious disease indicate everywhere the value of the veterinarian in the sphere of public health. It is known that various infectious and invasive diseases of animals, and especially those caused by bacteria and parasites, are transmissible to man. Man is rather susceptible, according to Wirth, to anthrax, glanders, trichinosis, psittacosis and rabies. Less frequent, but still possible, is the transmission of brucellosis, Malta fever, foot-and-mouth disease, variolar diseases, swine erysipelas, mange, ringworm, infectious anaemia, tuberculosis, tularaemia, as well as adult parasites or their intermediate developmental stages. The control and prevention of the spread of these diseases in the animal indicate clearly the importance of veterinary endeavour, and in the foregoing remarks only a part of this is depicted. The veterinarian in his work can have a far-reaching influence on the conduct of animal breeding and rearing and in this way can increase the production of important food stuffs for human beings. In the exercise of his calling, he acquires knowledge of the climate and soil of his own particular district and of the position of animal breeding in agricultural practice. He also gets to know the chief breeders of the neighbourhood and their herds and aims in breeding. He sees the kinds of fodder plants cultivated and knows whether home-grown or bought feeding stuffs are available. He also takes note of the method of animal husbandry, the conditions of housing, the prevailing diseases, the important breeders' associations, any productivity tests that may be carried out, the maintenance of breeding sires, etc. In short, he understands the state of animal breeding and husbandry in his own district. He sees both the progress and the backwardness, and people consult him on the advantages and disadvantages of the existing breeding methods. He witnesses the economic results of high production and is called in for the treatment of animals of low productivity and those which are constitutionally weak.

It is easy to understand that the breeder readily consults the veterinarian on animal husbandry questions. To-day health and constitution stand in the foreground, especially in cattle breeding. The frequency of udder diseases, the increasing disturbances of reproduction (sexual life), the relatively early onset of infertility and the problem of tuberculosis are often to be seen as the result of weakened constitution. There is a widespread opinion that with breeding for high production the health and vigour of animals is weakened. Recognition of this suggests that constitution is the foundation of all production and that a constitutionally weak animal does not show a normal duration of the growth period owing to the demands made by high production. Unfortunately this knowledge is still not common in breeding circles. Many pay attention to conformation and production; some only to production. They leave health outside their care, and yet it is the most important. Breeding for production with ailing and constitutionally weak animals cannot last long. It will soon be completely disrupted by disease and infertility. In Germany, the aim of high yields for one or two peak periods of production in cattle has fallen into disrepute and to-day the desire is for prolonged production from cows. This, however, is only possible with lasting good health and good constitution of the animals. Both health and constitution, if these are to be judged correctly, are the affair of the veterinarian, for he recognises the criteria of a good as well as the signs of a weakened constitution; the latter being manifested by such conditions as abnormalities in bone structure, the tension or strain of tendons and ligaments, skin and hair quality, extremes in growth of long bones, by a long fine head, by a flat chest, by misshapen limbs (*Senkrücken*), by puffy fetlocks, and by hairless patches on ears, eyes and mouth. In the absence of these criteria one may assume a good constitution, especially when physiological activity is regular and fully toned up and high qualities for production are in evidence. Knowledge of the fundamentals for efficiency of performance is of special importance. The veterinarian possesses this knowledge and he therefore regards production, not like the majority of breeders who regard it only from the point of view of economy, but also from the aspect of physiological requirements of the body and the functioning of the vital powers of the animal.

In Germany, the great value of constitution and health has been fully appreciated. In the first ordinance for the promotion of animal breeding, passed in 1936, it was laid down that the official veterinarian of each district (*Körung*) must be present at each selection of a breeding sire in order to "examine the animal

for constitutional defects and hereditary weaknesses as well as for the state of its health." The collaboration of the veterinarian is also required in other directions. The Reich Veterinary Ordinance of 1936 states in its first paragraphs: "The veterinarian is qualified (appointed to office, competent) to care for the health of the German livestock population, to co-operate in the improvement of its breeding and productivity and to protect the German people from dangers and losses through animal diseases as well as through foodstuffs and products of animal origin," and in another context it says: "The veterinary art serves the interest of the animal population and thereby serves the public health and public economy."

I am not aware whether in other States the co-operation of the veterinarian in the improvement of animal breeding has been defined so explicitly. It is certain, however, that for decades the veterinarian was in all countries the only scientific adviser for agricultural animal breeding and that several breeding districts still employ the beneficial collaboration of the veterinarian. It is also known, however, that certain circles would appear to wish to exclude veterinarians from the promotion of animal breeding in order to control the field of work themselves, though these circles are admittedly not the breeders themselves. They deny or conceal the qualification of the veterinarian to be an adviser in animal breeding. The great majority of veterinarians originate from the country and possess not only understanding of the problems of breeding but also love of animals. Day by day the veterinarian enters into animal holdings and sees therein good and bad animals, and because he belongs to his calling, it is obvious that he pays attention to faults in breeding and advises upon improvement, be it in breeding selection, rearing, feeding or management. More than the animal breeding official expert the veterinarian sees breeding and the after effects of breeding in all kinds of establishments, in markets and in the slaughterhouses; he learns not only to recognise progressive breeding policies but also the whole aspect of animal breeding in the countryside, with good, indifferent and poor animals. The veterinarian, therefore, above all, cannot be excluded from co-operation in animal breeding, for if he is, he is forbidden to exercise his own calling. Nor can it be said that the veterinarian should concern himself only with the sick animal and that he understands little of the breeding of healthy stock. The accomplishment of his calling is inseparable from knowledge of animal breeding. How could the veterinarian treat sick animals if he had not been instructed also upon the healthy animal? He must master the anatomy and physiology of animals, recognise breeds with their morphological and physiological characteristics, know what kind of production can be expected, and he must also know the methods of breeding, with their advantages and occasional disadvantages. In the case of inbreeding, for example, he has to be instructed in hereditary defects and diseases, and also in the whole field of genetics. How could he recognise the pathology or explore thoroughly the causes of a malady if he had not been trained in animal breeding and was unable to recognise normal conformation and production or to assess the influence of environment, condition and constitution? Above all, how could a veterinarian intervene successfully in animal healing if he were not instructed in the principles of the latest knowledge of nutrition and hygiene of domestic animals? Students of veterinary medicine attend courses of lectures on all these subjects and are examined in them. Recently, specially equipped animal breeding institutes, apprenticeship and research stations, inspections of breeding, and systematic exercises in judging have supplemented his knowledge during his course of study. The future German veterinarian must, before admission to examination, spend three months on an apprenticeship estate and during this time occupy himself thoroughly with the breeding and maintenance of the different animals. It cannot therefore be said that he is a stranger to animal husbandry.

In one further respect the veterinarian is marked out by his work for animal breeding: he gives his advice in general, not for money and reward, but out of his love for the animal, especially in the case of the healthy, well-kept and well nourished animal. He accordingly indicates how to pay attention to general rules for good maintenance, to systematic selection for breeding with hereditarily sound animals, and to the elimination of unfavourable environmental influences. Each success in these matters brings him satisfaction, gratification and joy. It is an old experience that the veterinarian who turns to account and imparts his knowledge of animal breeding is always welcome to the stock breeder. One finds, therefore, that the practical breeder is never the opponent of the veterinarian when the latter is willing to co-operate in the promotion of animal breeding. On the contrary, every breeder knows that the veterinarian can advise him on many questions, realising as he does what is remunerative and what is not. The veterinarian recognises and observes the difference between genotype and phenotype; he knows what characters are hereditary and what are acquired. He can enlighten the breeder on the question of how rich feeding, especially on protein-rich foods, during early growth, maintains, intensifies, and develops many existing

traits but generates nothing new. A genetically unsound animal will always remain genetically unsound, even when its surroundings and management are conducive to health. In daily intercourse with the stock owner it is therefore quite a natural thing that the veterinarian should be provided with opportunities to point out conditions likely to bring about diseases, and to enlighten the owner on the necessity for good housing, and what are the accommodation requirements of animals, ventilation, lairage and litter. Upon rearing and employment for breeding the veterinarian can also give a varied amount of useful information. He visits several breeders and sees and hears much information concerning the working of different breeding methods, the results of crossing and in-breeding, the too early employment of breeding animals, the care of pregnant and suckling dams, the handling of the newborn, faults in weaning, the care of the skin, hoofs and claws and such matters. How much room for improvement there is in these respects! Several animal diseases can be traced back to faulty feeding, and the veterinarian can also enlighten the breeder here. He can enlighten him upon the value of natural feeding upon pasture, upon the necessity for intervals in feeding times and gradual changes in food, upon the importance of minerals and vitamins, upon the manufacture and value of recently introduced kinds of feedings stuffs, as well, for example, as upon the fermentation of foods and the adulteration of feeding materials and upon the dietary disorders caused by poisonous plants, parasites and adulterants.

It is also customary for him to educate the breeder in the origin of diseases and epizootics, their mode of spread, control and prevention, in the causes and prevention of tuberculosis, sterility and diseases of young animals. The veterinarian can instruct the breeder upon such matters as the standards of judging breeding animals, for many breeders do not appreciate the really important criteria and why this or that quality is desirable—for example, a deep and wide chest, a well-proportioned back, etc. The veterinarian can indicate to the stockowner the advantages of maintaining a private record of breeding, the value of membership of a breeders' association and the effect of systematic production tests in the case of all species of animals. The spread of knowledge on heredity is also invaluable, not only because the veterinarian can teach the breeder what inherited qualities are good and bad, but because he can elucidate the laws of heredity as applied to live-stock breeding. He can give the breeder knowledge concerning these laws, explaining how doctrines of consanguinity may be erroneous, what are the principles of prepotency in certain sires, why the inter-breeding of cross-breds results in a mixed and irregular progeny, that acquired diseases and hereditary diseases in breeding animals must be evaluated as fundamentally different, etc.

From all this, the great importance of the veterinarian in the breeding and management of animals must plainly, without prejudice, be acknowledged.

(*b*) The Veterinarian's Importance in the Production of Foodstuffs of Animal Origin

The veterinarian is also guardian of human health. His activity promotes—as we shall see—the health of the public through supervision of the production of foodstuffs derived from animals. This supervision is necessary, for one knows that the following diseases are transmissible to man: trichinosis, various parasites and their developmental stages, the causal agents of meat poisoning as well as the above-mentioned "zoonoses." By thorough and regular examination of slaughter animals *ante-* and *post-mortem* and the rejection of unsound flesh, the veterinarian prevents the transmission of these diseases. He thereby fulfils a great, magnificent and exalted task in the service of mankind.

At the International Veterinary Congress held in London in 1930, the doyen of meat inspection, Robert von Ostertag, spoke on these duties. He gave a report upon the relationship of veterinary science to public health, especially in the production of meat and the marketing of this product. He pointed out that the production of meat was an easy matter when only healthy animals were supplied, but when this is not the case, production is checked: above all, through epizootics, although these may be countered by veterinary police measures and by stringent quarantine. Ostertag added "There belongs to veterinary science a title to fame for having, by the elimination and suppression of the so-called old or bygone epizootics of the economic domestic animals, substantially contributed to stability in the production of an abundant supply of meat."

The *veterinary inspection of meat* is based in all States upon the results of scientific research. It makes use of procedures which guarantee a rapid and reliable judgment of the flesh from the point of view as to whether it can be eaten by man without danger to his health. But meat inspection is also designed to guard against the eating of inferior meat, as, for example, that from diseased animals or animals slaughtered in emergency. This is examined in Germany in special veterinary institutes and is sold instead in the so-called *Freibank* with the designation of the inferior value of the meat if it is allowed at all for human consumption. How necessary and appropriate this measure is, is shown by

the result that the principal source of meat "poisoning" is accounted for by the sick animal, in the flesh of which certain "meat poisoning" bacteria, already present, proliferate. Chiefly they are the animals which are suffering from stomach and intestinal diseases, diseases connected with parturition, or diseases classified as toxaemias. Almost half the cases of meat "poisoning" in Germany have been traced to the consumption of beef and veal. Horse flesh is responsible for 29 per cent. Further, it is noteworthy that over one-third of all cases of meat poisoning observed in Germany have been traced to the consumption of the flesh of animals slaughtered in emergency.

To meat inspection also belongs, as has been mentioned, the inspection of slaughter animals in the living condition, for only healthy animals in general should be admitted for commercial slaughter. The flesh of diseased animals or those excessively fatigued (hunted to death) can readily give rise, according to experience, to the slighter disturbances of health, while its keeping qualities, through the occurrence of disordered metabolism, are impaired. The *dressing of carcases* must be under veterinary supervision and also the *storage* of meat, so that subsequent decomposition is avoided. The *manufacturing processes* of meat have also to be supervised by the veterinarian and he must exercise vigilance to see that no adulteration takes place. Recently also certain *slaughter by-products* have required attention, as, for example, the blood which is deposited in German slaughterhouses, according to Keller of Giessen, to the extent of 130 million litres (29 million gallons), of which, however, about 75 per cent. is valueless or is unsuitable for use. The by-products also comprise various glands which provide therapeutic materials for human beings. Their collection must be under veterinary supervision.

The guardianship of human beings from disease-producing flesh would not be complete if veterinary supervision ceased at the gates of the slaughterhouse. Meat inspection has therefore to be extended and supplemented by the *veterinary supervision of food materials*. This covers all places where flesh is brought for sale; processed or stored—markets, butchers' shops, restaurants, game, fish and poultry businesses, stores, including cold stores, and freezing plants. In a number of States this supervision of foodstuffs has been legally enforced, in Germany by the Foods Act of 1927. Included for examination under this Act are meat and meat products derived from slaughtered animals, game, poultry, fish, crustaceans, shellfish and molluscs which are destined for human consumption. Game, poultry, fish, etc., are brought under official veterinary food investigation for the first time. Through the veterinary inspector, all parts that are spoiled and thereby dangerous to health and all prepared foodstuffs which have been adulterated with illicit preservatives are prevented from being sold. Occasionally the veterinarian also finds non-inspected or insufficiently inspected meat, substitution of bad meat, etc. In this way the consumer is afforded extensive protection against food "poisoning." Wundram has reported that during eight years over 573,000 detailed inspections were undertaken by official veterinarians placed under him. These resulted in approximately 92,800 confiscations, comprising 66·7 per cent. for fish, 16·9 for meat, 16·1 for game and poultry, and 0·3 per cent. for eggs. Most of the spoiled food articles were found in markets and with street hawkers, where these wares seem more quickly to perish through excessive handling, influences of weather and dust. This indicates that meat and meat products ought to be kept under clean and covered conditions. Regular supervision may contribute greatly to this end by ensuring that these conditions are fulfilled. Veterinary supervision is not, however, universal. In the *Journal of the American Veterinary Medical Association*, A. F. Schalk, Columbia, regrets that the new legislation of the United States does not allot the supervision of foodstuffs of animal origin to the veterinarian, as is his special due. Apparently the veterinarian is not sufficiently appreciated as a guardian of the public health. Schalk therefore points out in this connection that "every veterinarian is more or less a servant of the public health. He is either directly or indirectly involved in the work of State preventive medicine and occupies a place—though perhaps an unacknowledged one—in the service of human health."

Finally, we see the veterinarian in several States engaged with success in the supervision of the *milk industry*. At the two last International Veterinary Congresses, at London and New York, von Ostertag and van Oijen have pointed out the great importance of the veterinarian in milk inspection. Both these researchers have drawn attention to the fact that disorders to health in the human subject may be caused by animal diseases being transmissible to man through milk. Such diseases include tuberculosis, brucellosis and bacteria of the Salmonella group. The diagnosis of these diseases in the animal is naturally the affair of the veterinarian, but unfortunately *veterinary* inspection of milch animals is not everywhere prescribed. In most States we find attention to hygienic measures relegated to the background. Raw milk ought to be fresh, clean, innocuous and of low bacterial content. German milk legislation (1930) goes further, and proceeds from the principle "Healthy milk comes only

from the healthy animal" and demands therefore regular *veterinary supervision of the condition of milch animals* used for the production of the two grades, "brand" and "superior quality" milk. These instructions have been formulated, because with veterinary inspection all diseased animals are detected, and especially those with diseased udders or which are secreting otherwise deleterious milk. This milk must then no longer be delivered raw as "brand" or "superior quality" milk, but must be heated beforehand, according to the instructions. It is to be hoped that all States which have taken measures to regulate the sale of milk will soon prescribe veterinary supervision of milch animals.

Summary

The activity of the veterinarian is often supposed to be limited to the treatment of sick animals. In reality, it embraces a much more varied and more extensive domain. Each State has enacted laws regulating veterinary police, meat inspection, supervision of food commodity markets, the protection of animals, the destruction of carcases and the breeding of animals. The veterinarian must collaborate in the interpretation and application of these laws.

To maintain the national wealth and assure food for the nation, the State encourages the breeding of animals through mediate and immediate measures, protects the herds from epidemics and organises the battle against these. The determined action of the veterinarian has brought about the eradication of various epizootics and has reduced others to a few outbreaks of little importance. This result demonstrates the importance of the veterinarian, still more from the fact that many of the diseases eradicated or controlled are *transmissible to man,* for example, anthrax, glanders, trichinosis, psittacosis, Malta fever, brucellosis, foot-and-mouth disease, tuberculosis, tularaemia, small pox, etc.

The helpful influence of the veterinarian applies largely to breeding, the enhancing in value of the animals and consequently the production of food commodities. The veterinarian continually increases his knowledge of breeding and the care of animals in his circle of activity.

We often admit, in our day, that sterility, tuberculosis, diseases of the udder and the ills of breeding are the consequence of *weakened constitution.* In Germany, we require rather permanent than highest efficiency; there, we prefer a more stable and sustained production, one which can be obtained only if the animal is healthy and robust. Only the veterinarian can know the state of health and the constitution of an animal. The presence of a veterinarian is demanded at each show of male reproducers. The veterinarian must direct his special attention to the *health,* the conformation of the animal and the eventual *existence of hereditary deficiencies.* The regulation of the Empire in that domain states: "The veterinarian must watch the health of the German herd and collaborate in the development of its breeding and its yield."

In the past, the veterinarian was, in the entire State, the only *scientific advisor in national breeding.* Others are jealous of this role, but without reason. From his professional knowledge the veterinarian is the person best qualified to direct breeding and to lead it into ever new channels. All unprejudiced persons should recognise the preponderant role of the veterinarian in the breeding and utilisation of animals.

The veterinarian is the *guardian of human health;* he inspects and supervises the food supplies of animal origin. This supervision is necessary. It prevents the consumption of meats of inferior quality or dangerous for man. This is why the slaughter of animals, the handling and the processing of meats into food articles are supervised and controlled by the veterinarian.

To insure the public health the *inspection of meats,* of food commodities offered for sale in markets, stalls, in restaurants, as well as other foods—deer, poultry, fish—in the large stores or in cold storage, should be completed by an authorised veterinarian. In numerous States such supervision is regulated by law.

Milk also can affect man and transmit to him, for example, tuberculosis, undulant fever and paratyphus. Only the veterinarian can recognise the presence of these diseases in the living animal; unfortunately, the *control of milking stock* by the veterinarian is not everywhere compulsory. Numerous States have enacted ordinances covering the production of milk. The German milk law of 1930 has it, in principle, "that only a healthy animal can give healthy milk," and exacts a continuous veterinary supervision over milking stock. The method has given excellent results.

From the foregoing, we may conclude that in all countries, the veterinarian has a field of varied and wide activities. The veterinarian must not be satisfied only with keeping the animals in good health; his activities must tend towards the betterment of the economic conditions of the country. He must collaborate in the development of breeding, in the increased yield of the animal herd and thus prevent grievous losses occasioned either through epidemics or by the consumption by man of unfit foods of animal origin.

Artificial insemination of cows and sheep is being carried out by the Italian Government to grade up stock in Abyssinia. Sperm from stud bulls and rams was carried by airplane from Italy to Abyssinia and injected into cows and sheep, the experiment showing success in 80 per cent. of the cows and 40 per cent. of the sheep. Further experiments are to be made.—*North British Agriculturist.*

The Veterinary Record

October 22nd, 1938.

The Loveday Report

THE OBSTACLES IN THE WAY OF ADOPTING AN IDEAL SYSTEM OF VETERINARY EDUCATION

EARLY in their report, the Loveday Committee record their general conclusion that the system of education and conditions in the veterinary schools are unsatisfactory, and then draw what they call a formidable indictment against the present training. To most observers acquainted with the situation the committee may be assured that despite the efforts made by several devoted men, their picture is not overdrawn. Veterinary education, as the report says, and as we well knew, has been starved. Granted that veterinary education is a subject of national concern and that with the tardy recognition by the State—incomprehensible in its tardiness to foreign observers—liberal public funds are to be diverted for its amelioration, what are the obstacles in the way of instituting an ideal system in this country?

To find a simple answer to this question we would enjoin our readers to peruse again the historical review which we published recently (July 16th) in this journal. In it we endeavoured to trace in retrospect the impact of our professional journalism upon the development of the veterinary profession as a corporate body. The course of development, we were forced to conclude, had been an aberrant one, and in no wise parallel to that in other civilised countries, where Governments had early recognised veterinary education as a subject of prime national importance and had given it ample subsidy. Soon after a system of veterinary education was founded in this country, by the enterprise and foresight of enlightened individuals a century and a half ago, it was left, by tragic circumstance, to the caprice and avarice of individuals. It was not until the veterinary profession constituted itself of its own initiative, with the grant of the Royal Charter of 1844, into a corporate body and took over supervision of the system of education that something was done to redeem it from a state of neglect and degeneracy. In the result, the determination of the veterinary profession to regulate its internal affairs and develop them along sound progressive lines led to the establishment of the one-portal system of entry. This triumph was accomplished about ten years before something similar but never quite equal to it in the scope of its powers was achieved by the medical profession. To-day the R.C.V.S. remains a central authority, with great powers for promoting healthy development of the profession, notably with its control of numbers so that the needs of the public are met and the inevitable deterioration that would occur through the excessive output of allegedly qualified individuals by competing educational authorities is avoided. The body is, moreover, eminently fitted to stipulate the essential ingredients of the strictly vocational training of its own members. It is in the interest of the State and the profession that the disciplinary powers of this body should be preserved inviolate.

The central body, however, has wielded no authority over the several schools except the important one of conducting examinations according to a prescribed curriculum of instruction.

If we were requested to give a simple answer as to why there are now obstacles in the way of instituting an ideal system of veterinary education in this country, we should say: The failure of the Government, in 1791, to give statutory powers to the committee which brought the London Veterinary College into being and the consequent disregard of the wise laws which they formulated. This failure led to a state of affairs which, when, after a long interval it was investigated by an Inter-departmental Committee appointed in 1936, could at best be only patched up. Where the Loveday Committee felt at liberty to start anew, as at Glasgow, it has prescribed a system of education which comes as near to the ideal as human ingenuity can be expected to contrive to meet the requirements of the present day.

The Royal Veterinary College, London, received a small annual sum from the State from 1795 to 1815, but after withdrawal of this sum nothing was granted until 1907. At that time, and certainly in 1921 when the Prain Committee sat, the whole question of veterinary education ought properly to have been investigated. One of the most illuminating reports of a departmental committee upon veterinary matters that has ever been issued was that of the Lovat Committee, in 1928,

appointed by the Colonial Secretary to investigate the problems of recruitment to the veterinary services in the non-self-governing dependencies. The recommendations of this committee have, to our profound regret, been allowed to lapse for the most part into abeyance. It drew attention, however, to the fact that the state of the Royal Veterinary College, London, in buildings and equipment, was "a national disgrace." This was the view of the Martin Committee appointed a little later specifically to investigate the state of that college and make recommendations for rebuilding and reorganisation. As is well known, this committee recommended rebuilding, at considerable cost, of the college on the same site. Somewhat earlier, another departmental committee, the Constable Committee, had reported, in 1924, that provision of State funds ought to be made to one veterinary college only in Scotland, namely, that at Edinburgh, and the grant of assistance to the Glasgow College should be discontinued. In spite of those numerous committees and the appointment of the Agricultural Research Council, in 1929, it was not until 1936 that the Government took the long-delayed step of appointing a committee to investigate veterinary education.

With great justification, we venture to say, the Loveday Committee has arrived at conclusions that are contrary to those of the Martin and Constable Committees. "None of the schools in Great Britain is ideally situated. The Royal Veterinary College, lately rebuilt in Camden Town, lacks effective contact with the related sciences, and is remote from farms. The decision to rebuild the college on its old site was, in our opinion, mistaken and portends increasing embarrassment over a long future." It may be asked why if the schools are not ideally situated in the midst of huge centres of urban population, we support the Loveday Committee in their recommendation to recreate a reorganised school in the second greatest area of human population in Britain, namely, in Glasgow. Our explanation is simply that the academic portion of the training is recommended to be undertaken under the wing of a great university, while facilities exist for the erection of an entirely new supplementary vocational centre in close liaison with it in some of the finest cattle raising country in the world. Rather than that this new vocational centre should be established within twelve miles of Glasgow, as recommended in the Loveday Report, we would suggest that it should be created in the neighbourhood of the West of Scotland Agricultural College and Hannah Dairy Research Institute, in Ayrshire, where, as nowhere else, a system of veterinary education can be fostered in an atmosphere likely to inspire its healthy development.

We shall need to revert to these questions, but we may conclude this article by saying that the Loveday Committee, in our view, has been confronted with a task of supreme difficulty. The obstacles that had stood in its way were the outcome of long-standing capricious development through lack of co-ordinated control and public support. When eventually public support was forthcoming, mainly through the pusillanimity of Ministers and State departments enquiry was undertaken piecemeal, and costly remedies applied which now appear on comprehensive examination plainly not likely to be of the best and most lasting advantage.

EXPERIMENTAL MONKEY COLONY FOR MEDICAL RESEARCH

The Calcutta correspondent of *The Times* states that a vessel bound for New York from Calcutta carries 500 selected rhesus monkeys to form the nucleus of an experimental colony on a small island off Puerto Rico. "This is the outcome of an embargo in India on the export of this kind of monkey to the United States for five months every year, as a result of the scarcity of these animals for medical research. Dr. Carpenter, of the College of Physicians and Surgeons, Columbia University, who is in charge of the monkeys, has been visiting India to study the situation. He says that conditions are arising in India which might end the export of the monkeys, while the importance of the rhesus for science is increasing. It is estimated that America requires about 20,000 every year."

* * * * *

In his address to the boys of Shrewsbury School at the opening of the new science buildings and laboratories, Sir William Bragg, President of the Royal Society, spoke of what science had done and was doing for the production of food. He had been approached a few years ago to examine two parcels of soil and rocks from New Zealand, both apparently the same. Sheep in the district where one of the rocks was to be found thrived while those in the district where the other rock came from were dying. On examination it was found that in one sample there was an absence of cobalt, the one or two parts to a million generally to be found. An injection of a tablet of cobalt beneath the skin of the sheep sufficient to last a year met the case.

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The King has consented to become President of the Royal Agricultural Society for the forthcoming year, during which the centenary show will be held in Windsor Great Park.

CLINICAL COMMUNICATIONS

A Case Involving Milk Fever, Tympany and Everted Uterus

R. A. S. WILSON, M.R.C.V.S. (Luton),
and
P. H. HOBBS (Luton)

Subject.—A five-year-old cross-bred Shorthorn cow that had calved two days previous to examination.

History.—An urgent message was received to visit a cow that was stated to be developing milk fever.

Examination.—The cow was found in a field lying on her brisket with her head turned round towards the left flank. She was in a comatose state. On closer examination it was discovered that the uterus had been everted, and by all appearance this had happened within the past hour.

Treatment.—It was decided to treat the milk fever first, by the subcutaneous injection of 600 c.c. of calcium borogluconate into the prescapular region. During this procedure the cow commenced spasmodic struggling, and had to be restrained by a man holding her horns. The everted uterus was about to be prepared for replacement when it was noticed that she was becoming dangerously tympanitic. In such circumstances it would have been impossible to return the uterus without relieving the pressure caused by the gas. By now the cow was *in extremis* with a tinge of blood appearing on the nasal mucous membranes. A small site at the highest point of distension was hurriedly clipped and cleansed, and then a trocar and cannula inserted. The trocar was removed and the gas allowed to escape.

Having relieved the tympany of the rumen, a commencement was made to replace the uterus. Fortunately, the cow did not labour much, otherwise spinal anaesthesia would have been resorted to. From this stage onwards the breathing of the animal steadily improved, and the cow was beginning to appear more comfortable. The everted uterus was washed with an antiseptic solution of a suitable strength and a clean sheet placed between the organ and the grass. The womb was replaced without much difficulty and an iodoform pessary inserted into it. As a precautionary measure the vulva was sutured with sterile tape.

The above operation having been performed, the owner was instructed to keep the cow propped up on her brisket to prevent any recurrence of the tympany.

Five hours later, on revisiting the farm, the beast was still lying in the same position as she had been left. Upon approaching her she regained her feet and walked with an unsteady gait towards the farm. On the way she had a drink of water from a trough, and by the time she was placed in a loose box was more steady. The vulval sutures were removed and uterine examination was carried out to ascertain whether the organ was in its natural position. It was found to be satisfactorily placed, but as a precautionary measure the vulva was once more closed by sutures.

The next day the cow was re-examined and found to be feeding well. She showed no signs of discomfort. The vulval sutures were removed and four stimulating drenches were left at the farm to be given at intervals during the day.

We have placed this case on record because although the three conditions of milk fever, tympany, and everted uterus, are all commonly met with separately in general practice, it is not often that the *Veterinary Record* contains reports of cases where all three conditions occur in the same animal at the same time, followed by recovery.

Fig. 1.—Showing the state of the cow on primary examination.

Fig. 2.—The same animal five hours later.

An Aborted Monstrosity

D. L. ROBARTS
St. Albans

Subject.—An eight-month developed foetus with eight limbs and one head aborted by a seven-year-old Shorthorn cow.

History.—The monstrosity was found in the pasture. The offspring of both sire and dam had hitherto been normal but the dam had previously attempted to kill its calves.

Examination.—The foetus consisted of two moieties; one with head, neck, thorax, abdomen, fore and hind limbs, the other with abdomen, fore and hind limbs, no head or neck and a thorax laterally compressed so as to occlude any cavity anteriorly. One thoracic wall was rudimentary in its development and fused to that of the other moiety, allowing considerable communication between each thoracic cavity.

Alimentary System. — Oesophagus, stomach and duodenum were present only in the "head" portion, but jejunum, ileum and large intestine were in duplicate, and apart from the two recta, extruded in a common extra-abdominal sac which also contained dual liver elements. There were two communications between the two digestive tracts, one at the commencement of the jejunum, the other some ten inches proximal to the ileocaecal valve.

Respiratory System. — The headless thorax contained no thymus, heart, bronchi or lungs, these being present in the adjacent thorax.

Urinogenital System.—This was in duplicate and was female. In both cases the right cornu of the uterus was poorly developed. Each bladder had a urachus.

Vascular System.—From the left ventricle of the single heart arose an aorta for the supply of the "head" portion of the foetus. From the right hypogastric of this aorta arose one umbilical artery. From the pulmonary artery at the level of the ductus arteriosus arose another and larger aorta for the supply of the headless portion which it gained by traversing the deficiency in the common thoracic wall. An umbilical artery arose from each hypogastric of this aorta.

Discussion.—The interest of the case lies not only in the anatomy of the vascular and digestive systems and in the consideration of their development, but especially in the fact that this monstrosity should have been aborted.

ABSTRACTS

[Deformities of the Extremities in Foals. Peters (1938.) *Deuts. tierärztl. Wschr.* **46.** 22, 23 and 34.]

The author describes certain cases seen in twelve years' practice.

Congenital Knuckling of the Fetlock.—Foals are sometimes born with their forelimbs or one forelimb malformed in such a way that the fetlock joint cannot be extended beyond 180 deg. In such cases, or where the joint cannot be put out of flexion, the animals knuckle over completely, and so that all the anterior face of the pastern and hoof rests on the ground. If this exists for more than one or two days the skin over the end of the cannon bone becomes eroded. Foals so affected may or may not be able to get about and they have difficulty in sucking. Peters quotes many veterinary writers on the cause of the condition and concludes that the flexor tendons fail to lengthen owing to an abnormal posture of the foal *in utero*. One or two persons suggested that heredity may play a part, but it seems more likely that knuckling in foals is due to general lack of vigour, especially in cases in which all the joints are weak and loosely knit. Three cases are described—one farm horse bilaterally (killed before treatment had been finished), one thoroughbred bilaterally and one farm horse unilaterally. Attempts were made to hold the fetlock joints in extension by splint bandages but they could not be kept on firmly. Success was then obtained by using plaster of Paris bandages, which were removed in eight days. Cases 2 and 3 recovered completely.

Hyperextension of the Fetlock.—Four cases in farm horses, all bilateral, were observed, two being treated with splint bandages and two with plaster of Paris bandages; one of each pair recovered.

Acquired Knuckling of the Fetlock.—Peters distinguishes two types. In the first the first phalanx is situated normally in relation to the cannon bone and the third phalanx and hoof are doubled under backwards, whilst in the other the knuckling begins with the first phalanx and the pastern is upright. *First type, so-called "Bockhuf."*—This usually occurs in foals two to twelve months old and is nearly always limited to the forelimbs and is more commonly unilateral. It is usually observed on the examination of foals which have been at pasture for a few months and tends to be overlooked in its early stage because there is no lameness at all, although the foal goes on the toe of the affected foot with the line of the wall at the toe vertical or even well past the vertical. On examination all parts appear normal except that the hoof is drawn backwards and attempts to extend the joint are inhibited by a short deep flexor tendon. In extreme cases the condition amounts to a sub-luxation of the coffin joint, the distal joint surface of the second phalanx over-riding that of the third phalanx anteriorly. Treatment in the early stage is by a special shoe to raise the toe and keep the heels down. In the advanced stage the condition can be rectified either by section of the collateral sesamoid ligaments [Bradley's system] or by deep flexor tenotomy at mid-cannon level. In Peters' hands, however, both methods have turned out badly in the long run (rapid apparent cure followed later by tendinitis or obscure lameness). *Second type, so-called "Stelzfuss."*—This type occurs in older foals and young horses and is nearly always bilateral in the forelimbs. Affected animals have a stilted gait, which distinguishes it clearly from the first type. The cause is unknown. The degree of knuckling varies with the weight placed on the limb at a given moment. The hoof is placed flat on the ground but may have overlong heels and, rarely, be concave down the wall at the toe. Peters saw four heavy farm foals and two thoroughbred foals affected: five were killed as incurable and the other, a thoroughbred filly, was subjected to experimental treatment. In one leg the superficial flexor tendon was severed and in the other the deep flexor tendon (at mid-cannon level in each leg). The result was quite satisfactory in the latter but poor in the former, the knuckling being only partially corrected.

This interesting article contains numerous quotations from other writers in addition to the author's case records and views. Acquired knuckling arising from tendon contraction due to disuse of the limb on account of severe lameness is mentioned but purposely omitted from discussion.

J. E.

[**Treatment of Congenital Hyperextension of the Fetlock in a Foal.** Bolz (1938.) *Tierärztl. Rdsch.* **44.** 32. 523-524.]

A report of the successful treatment of a foal with maximal hyperextension of the fetlocks of both forelimbs. The legs from below the knees downwards were bound up firmly in a thick cotton-wool dressing over which were secured two strong metal plate splints, in front and behind. The front one was bent back under the toe of the hoof, thus taking the weight, whilst the rear plate extended to the heels, not reaching the ground because the fetlock joint was set in a position of slight flexion. After eight weeks the splint dressings were removed and the foal was cured.

J. E.

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[**Ventriculectomy Operation for Roaring, with special regard to Indications and Operative Technique.** Weischer, F. (1938.) *Berl. Tierärztl. Wschr.* 17. 245-247 (7 figs.)]

For the operation of stripping the ventricle to be successful post-operative cicatrisation must bring about occlusion of the ventricles, and the vocal cord must remain permanently in the position it would normally occupy during inspiration.

The author stresses the necessity for stripping the ventricular mucous membrane in its entirety, especially at its junction with the vocal cord. On no account must the vocal cord itself be injured, otherwise possible granulations might impede the respiratory tract.

The technique adopted is as follows. The animal is cast, and under deep chloral hydrate narcosis the incision into the larynx is made in the mid-line, extending backwards through the cricoid cartilage, and the first tracheal ring. The primary incision in the ventricular mucous membrane is made along the false vocal cord after stretching the pouch with glove stretcher forceps. To assist separation of the mucous membrane of the pouch, air is pumped under it. Detachment is completed in the usual way by the finger. A tracheotomy tube is introduced into the wound immediately after the operation, and is left in position for three days.

In the author's experience cases in which the muscles activating the cord are completely paralysed heal better and give better results than those in which there is only a partial paralysis. The explanation put forward is that when the muscles controlled by the recurrent laryngeal nerve are only partially paralysed, there still remains some movement of the vocal cord after operation. This movement on the part of the cord prevents rapid and straightforward healing.

C. F.

[**The Causes of Deaths following Operations on Farm Animals (Insurance Company Statistics).** Hoffman, J. A. (1938.) *Munch. tierärztl. Wschr.* **89.** 13. 145-146.]

The cause of death in each of 250 animals is given, followed by a discussion. Thirty-five cases were stallions which died after cryptorchid castration (24), umbilical hernia (6), scrotal hernia (3), and one case each of scirrhous cord and chronic pectoral abscess. Most of the above were due to infection causing death by peritonitis.

Six cases were mares which died after operations—ovariotomy (2), and one each of abdominal hernia, ligamentum nuchae resection, bone tumour and udder tumour.

Seven cases were cows which died after ovariotomy (two from peritonitis, four from haemorrhage and one from intestinal injury).

One was a boar which died after a rig operation from peritonitis.

The remainder of the cases, 201 in all, were 153 stallions and 48 boars, all of which died after simple castration. The most important causes of death in the stallions were peritonitis, septicaemia, thrombosis, tetanus, hernia, haemorrhage, bone fracture and nerve injury during casting, and anaesthetic poisoning. In the boars haemorrhage was the cause in 13, anaesthetic poisoning in 12, septicaemia in eight, peritonitis in six and various odd causes in the remainder.

The moral of this is that one cannot be too careful in castration technique, including the preparation of the patient.

J. E.

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[**Epidural Administration of Tetanus Antitoxin.** Stubenrauch, L. (1938.) *Wein. Tierärztl. Mschr.* **25.** 9. 278.]

Stubenrauch describes the treatment of a severe case in a horse. Within an hour of the epidural injection of 200 units of tetanus antitoxin, muscular tension was slightly alleviated and respirations easier. The effects wore off in 16 to 20 hours. Injections were given at the same time each day for eight days but, when on the ninth day no serum was given, symptoms recurred with increased severity so treatment was continued. On the twelfth day the dose was reduced to 100 units and three days later stopped altogether. The animal made a slow but uneventful recovery.

A further case is also recorded where success followed an even shorter course of treatment. Injections were, however, commenced when symptoms were first noticed.

Attention is drawn to the small number of units required as compared with those necessary when the subcutaneous route is selected.

N. S. B.

[**A Case of Infection in the Horse with Erysipelothrix rhusiopathiae (Swine Erysipelas).** Paterson, J. S., and Heatley, T. G. (1938.) *Vet. Journ.* **94.** 1. 33-34.]

A three-year-old filly was found to be suffering from fever, rapid pulse, capricious appetite and lameness. As the illness proceeded almost all the joints became swollen and painful till finally the animal was destroyed. On *post-mortem* examination chronic verrucose endocarditis was found and an organism apparently identical with *Erysipelothrix rhusiopathiae* recovered.

P. S. W.

REVIEW

[**Treatise on the Infectious Diseases of the Domestic Animals.** By Professor L. Panisset, of Alford Veterinary College. Vigot frères, Paris, 1938. pp. 562. 120 frs.]

This book would be more correctly entitled "Treatise on the Most Important Infectious Diseases . . ." as it contains essays on only 28 bacterial, protozoan and virus diseases and ignores many quite important diseases such as streptococcal mastitis, caseous lymphadenitis, and navel-ill. The diseases described are, however, excellently dealt with and the author has evidently been at pains to acquaint himself with world literature, judging from the very numerous quotations from named workers. The book is written in a clear and concise style and is consequently packed with a maximum of important information, making it extremely valuable as a standard reference book, though it falls short of being a complete reference book of the German encyclopaedic type of work. From the Englishman's point of view there are one or two curious lacunae; for instance, various anaerobic infections are described under the heading "septicémie gangréneuse" and the ten-page chapter seeks to describe *en bloc* about eight conditions in the various animal species, with the result that the description of each one is very scrappy and lamb dysentery has been overlooked. Similarly no attempt has been made to consider the interidentity of equine influenza and the French equivalents, so-called "typhoid fever" and "infectious pneumonia."

The printing is clear and the section headings well chosen to guide the reader quickly to his point of interest after consultation of the elaborate contents list, which, as in all French books, is placed somewhat illogically at the end. There is no index, but one is not really necessary.

All French-reading veterinary surgeons and students cannot fail to deepen their knowledge by a study of this book which can be freely recommended.

N.V.M.A. DIVISIONAL REPORTS

Society of Veterinary Practitioners

I.—Meeting in London*

A meeting of the above Division was held at 36, Gordon Square, W.C.1, on the afternoon of Wednesday, July 27th, 1938, when, in the absence of the President (Sir Frederick Hobday), the Chair was occupied by Major Hamilton Kirk. There were also present: Mr. J. B. Dier, Major J. I. Edgar, Major A. N. Foster, Colonel H. Greenfield, Dr. T. Hare, Captain F. Marks, Captain W. F. Morton, Mr. G. S. Muir, Mr. C. R. A. Powell, Mr. H. L. Roberts, Mr. S. E. Sampson, Mr. C. Weighton, Captain T. L. Wright and Mr. T. A. R. Chipperfield (Assistant Hon. Secretary).

Apologies for absence were received from Sir Frederick T. G. Hobday and Mr. R. A. Willett.

The minutes of the meeting held in London on March 30th, 1938, having been published in the *Veterinary Record*, were taken as read and signed as correct.

Elections to Membership.—The Assistant Hon. Secretary read the following names of persons who had applied for membership of the Society, and proposed that they be duly elected :—

Captain A. A. Abbott, Burnham-on-Sea; Mr. J. H. L. Addis, Newbury; Captain G. T. E. Anderson, Aylsham; Messrs. T. S. Anderson, Altrincham; A. H. Andrew, Ware; Major W. Ascott, Bideford; Messrs. W. C. Auld, Wincanton; E. D. Barker, York; Major H. Begg, Strathaven; Miss W. M. Brancker, Bexhill; Major H. W. Brekke, Darlington; Captain M. Bridgeman, Cosham; Mr. J. Buckingham, Harleston; Lieut.-Colonel T. E. Burridge, Frinton-on-Sea; Messrs. T. Butcher, Cleobury Mortimer; A. Campbell, Stokesley; Lieut.-Colonel A. F. Castle, Ipswich; Mr. W. S. Codrington, Wotton-under-Edge; Messrs. E. G. Conisbee, Axminster; P. Connolly, Andover; D. Coull, Brentwood; P. R. Court, Wotton-under-Edge; J. Currie, Worcester; C. B. Davidson, Dalkeith; Captain R. W. Down, Andover; Captain J. A. Edwards, Ringwood; Messrs. J. H. Ellis, Trowbridge; C. Elphicke, Bedford; K. H. Everett, Farnham; Miss M. J. Farman, London; Messrs. J. D. Ferguson, Crieff; T. A. R. Filgate, Faringdon; A. W. Findlay, Stratford-on-Avon; J. Forgham, Market Drayton; A. E. Gachet, Banwell; Major J. G. E. Gallie, Ash; Mr. C. R. Golledge, Trowbridge; Captain A. F. Good, Aberdare; Messrs. H. L. Gravelle, Llandilo; D. S. Haggart, Newcastle-on-Tyne; G. A. Harrison, Wisbech; Captain A. Hart, Ardnadam; Mr. C. S. Haselden, Northwood; Major F. E. Heath, Stevenage; Captain C. G. Hearn, Newton Abbot; Messrs. L. D. Hepworth, Birkdale; H. G. Hewetson, Southport; F. Hewson, Melbourn; G. C. Hill, Glasgow; D. R. F. Hoddinott, Plymouth; B. Holmes, Settle; A. C. Hume, Hersham; F. J. Hyland, Banchory; G. C. Inglis, Alloa; Major T. M. Inglis, Ingleside; Messrs. W. P. Isherwood, Driffield; D. Ll. James, Llanybyther; F. H. Jenkins, Grimsby; C. N. Jones, Northwich; D. J. Jones, Maesllyn; W. S. King, London; E. M. Lamb, London; Captain R. M. Lee, Crewe; Mr. D. A. Lemon, Loughborough; Miss B. L. Lock, Farnham; Mr. W. P. Loft, Basingstoke; Captain A. Logan, Bassingham; Major H. H. Lord, Eccles; Messrs. H. A. McClelland, Aberdeen; J. McIlwaine, Maesslyn; Captain R. D. Mackintosh, Insch; Captain D. G. MacLeod, Easingwold; Messrs. I. G. MacMillan, Edinburgh; K. I. Marshall, Bridport; W. F. Maynard, Romsey; A. Millar, Bishop's Stortford; R. Millar, Bishop's Stortford; J. E. Mills, Caersws; J. T. Morton, Stratford-on-Avon; J. J. Murdoch, Dundee; J. Nisbet, Forfar; J. W. Oakley, Uppingham; D. D. Ogilvie, Edinburgh; A. B. Orr, London; Major G. E. Oxspring, Ashford; Messrs. C. M. W. Park, Crawley; C. R. A. Powell, Luton; Captain J. C. S. Powell, Clevedon; Messrs. E. W. Prescott, Manchester; W. Rattee, Northwich; J. F. Rees, Carmarthen; T. J. Reynolds, Cirencester; Major A. L. Robertson, Arbroath; Messrs. J. P. G. Runciman, Cambridge; W. Runciman, Ely; A. S. Rutherford, Lyme Regis; G. W. Rutherford, Forres; Major R. J. Sargent, Guildford; Messrs. E. D. Sewell, North Molton; G. N. Shirley, Crewe; Captain W. Sime, Leven; Captain G. Simons, Lancaster; Mr. F. H. Sugden, Grantham; Captain W. G. Thomson, Stafford; Mr. A. L. Walther, St. Leonards-on-Sea; Captain W. Waters, Halstead; Messrs. W. J. B. Watson, Thornbury; M. E. White, Petersfield; F. T. Williams, Sherborne; O. Ll. Williams, Llangefni; G. T. Willows, Lymington; Captain A. C. Wilson, Berkhamsted; Messrs. A. R. Withers, Harrogate; A. E. Wood, Hailsham; B. E. Wooster, High Wycombe; A. M. Wylie, Grays; R. L. Wylie, Upminster and Captain E. H. Wyly, Henfield.

The CHAIRMAN, commenting that the list of 116 names indicated a very satisfactory state of affairs and that the total membership was now 584, asked if it was the wish of the meeting that those nominated be elected, and this was unanimously agreed.

*Received for publication August 23rd, 1938.

Presentation Appeal Fund.—The Assistant Hon. Secreatry now rose to say that before proceeding with the business of the meeting, he wished to draw their attention to an appeal fund for a presentation to their Hon. Treasurer, Mr. E. P. Edwards. Mr. Edwards, as they all knew, had been the founder of their Society and was still the moving spirit. Just recently he had been very ill indeed, but fortunately his health had now improved. It had been hoped to make the presentation at Congress, N.V.M.A., but it was now felt better to postpone it till the Annual General Meeting, to be held in September. At the present moment, the fund stood at £32 15s., and he wished all those desiring to subscribe to send their contributions to Dr. Hare.

Centralised Veterinary Service

The Chairman now called upon the Assistant Hon. Secretary to open the discussion on the main item on the agenda, namely, the working of the new Centralised Veterinary Service.

The Assistant Hon. Secretary, complying, said that he was now in a position to give the Society a résumé of the activities of the "so-called" Executive Committee of the Society.

At that last meeting of the Society, they would remember, a sub-committee was appointed to go into cases of hardship and sort them out before they went to the "National," so that frivolous cases should be eliminated. The name "Executive" was used as a matter of expediency; the Committee was actually an *ad hoc* Committee, appointed for a specific purpose, and it was called "Executive" as a means of indicating to members that it was going to act on their behalf.

The Committee had had six meetings in London up to the middle of June, and over 25 cases had been definitely considered. Of these, they had been able to advise one or two members as to the best procedure; they had sent 15 cases to the Consultative Committee of the "National," who took the whole lot *en bloc* to the Ministry, and of these 10 had been appointed to Panel A and one to Panel B; and in one or two cases the Ministry requested that the case be held over till the end of the first year.

The Committee came to the conclusion from the evidence that most of the hardship and grievance suffered by members was in the case of men appointed to Panel B who were deprived of Accredited Herd inspection, especially in the Midlands, in Staffordshire and in counties where there were large numbers of flying herds. This Society wished to get an extension of Accredited Herd inspection to Panel B, but such a departure from the agreement between the Ministry and the "National" was not at present possible, for it had been agreed not to make radical changes before a year's trial had been completed. The Ministry had, however, agreed to reinstate those Panel B inspectors who had lost their markets. The Ministry would reinstate the majority of these Panel B men, but reserved the final decision to themselves. This had, of course, to be granted.

He might perhaps mention there that he had been honoured in that he had been invited to attend meetings of the Consultative Committee and had been co-opted for the purpose of going to the Ministry with them. (Applause.) The Ministry had conceded the principle that Panel A be an expanding panel, which was a departure from their original view in that they had envisaged a set number of practitioners constituting the Panel. With regard to the position of women graduates within the scheme, the Ministry had been reminded that as women take the same course as men, and were granted the same statutory rights, they should not be debarred from the Panels, and he was glad to see that a woman graduate had been appointed to Panel A. Prior to this, the Ministry's ruling had been that women should be eligible for Panel B only.

The Ministry, however, made certain reservations, and as he had mentioned, had reserved the final decision to themselves as to whether a man should be appointed to either Panel. They quite realised that there were a number of practitioners who were competent and who were not on Panel A. Conversely, they pointed out that there would probably be a number of men on that Panel, who would be found in the course of time not to be competent to carry out the work. It might occur, at the end of the year, therefore, that some people on Panel A, if they had failed to discharge their duties, would be relieved of their appointment. That was, of course, quite reasonable—incompetence could not be condoned.

In regard to the Ministry's attitude and the way in which they considered these problems as they came up—he thought they had been particularly fair-minded in considering individual cases, and they had never adopted a definite and automatic point of view. They reserved the right not to appoint all eligible men in any one town; for example, in a large town where there were three or four eligible veterinary surgeons. It was the view of the Committee that they should appoint as many people as possible and "spread the butter thinly."

There was, of course, a risk that many Panel A men would be so only in name. At the present time the Ministry's activities were naturally in rather an unsettled state and a reasonable time would have to be allowed to overcome this. There was evidence to show a considerable lack of uniformity in the way in which the scheme was being administered throughout the country;

in the Midlands, for instance, one man had previously examined 160 Accredited Herds but had only been allotted eight. He (Mr. Chipperfield) had been doing locum for a friend in a county where there were few Panel A men, and there, on the other hand, a reasonable volume of work was forthcoming. This lack of uniformity might be due to the fact that headquarters had not instructed the Superintending Inspectors uniformly, or it might be that the administration was being left to individual Superintending Inspectors.

Before concluding, Mr. Chipperfield said that he wished to stress two points. The first was that members should encourage the Attested Herds' Scheme as much as possible. They would get the benefit of the Initial Tests and the Assisted Tests, and then the Ministry intended to employ the practitioner who had brought them up to attestation for the re-tests. The second point was that members should do their own work as thoroughly and efficiently as possible, and do their utmost to work amicably with the Superintending and Divisional Inspectors.

The CHAIRMAN, remarking that he considered members should be very grateful for the efforts put forward so successfully on their behalf, now declared the matter open for discussion.

An exhaustive discussion on the working of the new Service followed, those taking part, in addition to the Chairman and Assistant Hon. Secretary, being Lieut.-Colonel H. Greenfield, Dr. Tom Hare, Messrs. Phillipson Moss, G. S. Muir, C. R. A. Powell, S. E. Sampson, C. Weighton, F. W. Willett and Captain T. L. Wright.

Following were among the points made in the discussion :—

That the " fundamental claim " of the Society, that the stock-owner should determine which inspector he would employ, be maintain edand adhered to and planned for by the Society.

That individual Superintending Inspectors should be able so to arrange administrative details as to ensure uniformity in such matters as county boundaries ; the position of practitioners living on several county boundaries must be regularised.

That the choice of test for the tuberculin re-test should be left with the practitioner.

In relation to the question : " By what criterion are panel appointments made ? " the ASSISTANT HON. SECRETARY said that they had had to allow the Ministry the final decision as to whether a man was suitable or not. The reply to the question whether that Society and the " National " had abandoned the principle that practitioners should inspect the herds of their own clients, was that they had not.

In the course of further remarks, the ASSISTANT HON. SECRETARY said that he would like to invite those attending as visitors that day, if they were satisfied that they were an energetic Society, to join them. He was mooting an idea with regard to the organisation of the Society and he intended to elaborate it and bring it up at the Annual General Meeting. It was very difficult to get a Council Meeting together because the Society was very diffuse, and a certain amount of elasticity was necessary. He would like to see the Executive Committee officially recognised as an executive committee with power to act, meeting in London as an unofficial cabinet. Prompt action was often necessary and he would like the Executive Committee to be on a permanent basis for as long as it held the confidence of the Society. He wanted small committees of men ready to represent each section of the profession—representatives of bovine, canine, feline and poultry practitioners, etc. These would get material together and send it in to be dealt with.

With regard to the future policy of the Society, he would give them his views briefly. They had to have two planks :—

(1) An equal panel, and

(2) Freedom of choice by the stock-owner of the practitioner to carry out the Ministry's work.

As they had been reminded, the latter was fundamental: he (Mr. Chipperfield) maintained that the equal panel was also fundamental—the business of classifying their professional brethren as first and third class was all wrong and they must organise resistance against it. In the meantime, he wanted all the information he could get with regard to hardship and chaos, or anything like that. He had outlined their long-term policy and their short-term policy was to smooth over the existing difficulties.

The CHAIRMAN thanked Mr. Chipperfield and his fellow members on the Executive Committee for the great work they had done on behalf of the Society.

Future Meetings.—Mr. SAMPSON having suggested that the Society should hold a meeting in the north, it was eventually agreed that a meeting should be held in Leeds in October, the Annual General Meeting to take place in London in September.

" *Any Other Business.*"—The only other item on the Agenda was " Any Other Business," and under this heading, the CHAIRMAN briefly addressed the meeting on the subject of securing authenticated information regarding quackery. He was sending out written appeals for such material, but if anybody present could help by giving definite instances of maltreatment, etc., he would be very pleased to hear from them.

The meeting now concluded with the passing of a vote of thanks to Major Kirk for his conduct in the chair.

A. B. MATTINSON, *Hon. Secretary.*
T. A. R. CHIPPERFIELD,
Asst. Hon. Secretary.

II.—Meeting in Birmingham*

Members of the Society of Veterinary Practitioners met at the Grand Hotel, Birmingham, on Friday, July 15th, 1938, to discuss the operation of the State Veterinary Service.

Mr. H. W. Steele-Bodger was voted to the Chair, and those who signed the attendance register included Messrs. G. Simons, A. A. Mackenzie, J. Cochran-Dyet, G. R. Benbow, F. Chambers, W. L. Dwerryhouse, T. B. Yarrow, D. B. Macmaster, J. W. Conchie, J. C. Deville, A. A. Kidd, J. Currie, O. V. Gunning, G. L. Lancaster, W. Jones and the Assistant Hon. Secretary, Mr. T. A. R. Chipperfield.

Apologies for absence were received from Captain J. Cane, Captain H. W. Dawes, Major A. N. Foster, Sir Fredk. Hobday, S. Jennings, Major A. B. Mattinson, Captain A. H. Watson and T. Wilkinson.

The CHAIRMAN, in the course of some introductory remarks, said that the present membership of the Society was about 580, an increase of 110 during the last three months, and the financial position was satisfactory for the moment. That was unusual, although he did not like the idea of a big bank balance. When they were not spending money it looked as if they were doing nothing. That was not the case with this Society, and with the work that lay immediately ahead of them the sum in hand would not leave them with anything to spare.

Referring to the new Centralised Veterinary Service, the CHAIRMAN said he did not know whether anyone present was getting more work as a result of it, but certainly some of them were not. However, in some districts practitioners were working full time, but there were some counties, such as Cheshire and Staffordshire, in which there was practically no Panel B work to be done. It was hoped that the Ministry would treat those in such areas as "hardship" cases.

He mentioned that market inspection is to be made available to Panel B men, and those practitioners who had lost market inspectorships will probably get them back again. Such cases, they were assured, would be treated on their own merits. In almost every case of hardship which the "National" had taken to the Ministry, they had had satisfaction. In some cases the Ministry were not prepared to appoint to Panel A, but they had found the Ministry prepared to consider cases of hardship where they arose and see whether it was possible to extend Panel A. It appeared that they were willing to let as many as possible participate in Panel A work, but if that work was to be temporary, it would not matter much either way.

The ASSISTANT HON. SECRETARY informed the meeting that the Society had so far investigated 24 cases of complaint which were sent in, of which 15 were passed on to the Consultative Committee—who, after considering them, raised them with the Ministry. Of these 15 cases, 10 were appointed to Panel A, one was appointed to Panel B, and several they wished to defer until the end of the first 12 months.

In reply to a request for information in regard to the existence of any cases of men who had been promoted from Panel B to Panel A who were not employed, the CHAIRMAN said that any Panel A inspector must, within a reasonable time, have work allotted to him.

The Chairman, the Assistant Hon. Secretary and the following members took part in the ensuing discussion: Messrs. G. R. Benbow, F. Chambers, O. V. Gunning, A. A. Kidd, G. L. Lancaster, A. A. Mackenzie and G. Simons.

At the termination of the discussion, in which "personal instances" of alleged hardship were cited, the ASSISTANT HON. SECRETARY said that one or two salient points seemed to stand out from it. One was that certain districts were thinly populated by Panel A men. There were one or two districts—Eastern Counties and Hampshire—where they had had success in getting men appointed to Panel A. He thought it would be a sound plan if he could get sufficient information to take complaints up as area complaints and not as individual complaints. He should like to be able to quote comparisons and figures, but to do that it would be necessary to have more information than he had at present. It was for them to get such information from their neighbours, and they could take the matter up when next they went to the Ministry. "Although it is not strictly relevant to the trend of this debate," proceeded Mr. Chipperfield, "I would like to put forward what our future policy ought to be. At the moment, we are dealing entirely with the present, and trying to straighten out the tangle, but we have to have something in view for the future. I think the chief thing to aim at is to establish the right of the stock-owner to choose the veterinary surgeon he prefers for this work. I think we are pretty well agreed as to what we want as a profession and the only difference between us is the method by which that can be attained. The position to-day is unsatisfactory."

THE CHAIRMAN: "Just one word about the rights of the stock owner. There are some diseases which you can rightly describe as emergency diseases, such as anthrax, swine fever, sheep scab and foot-and-mouth disease. If it had been possible to get the Ministry to agree to those things being done by a whole-time staff of Panel A men, and all non-emergency treatment left to Panel B men, we should have been better satisfied."

*Received for publication August 23rd, 1938.

Mr. CHAMBERS observed that the difficulty was to get whole-time men to appreciate the personal element—that close personal touch between the practitioner and his client.

Other members present mentioned anomalies that had arisen under the new scheme, involving losses more or less serious in their own practice or their neighbour's.

The CHAIRMAN said that one important thing to do was to stop under-cutting, because there was the danger of the Ministry taking the lowest fee as the standard, which was not fair. Under-cutting that might lead to such a result was, in the Chairman's opinion, "unprofessional conduct which ought to be dealt with."

Mr. GUNNING observed that that was a matter which the "National" ought to take up with the Divisions. They must all agree it was very serious.

The CHAIRMAN, in closing the discussion, renewed his appeal to members of the Society to put their complaints into writing and let the Secretary have them. "I know," he said, "there are plenty of complaints if members will only let us have them. You cannot expect us to do much without your help, so that it is up to you to move in this matter if you want your grievances redressed."

T. A. R. CHIPPERFIELD, *Asst. Hon. Secretary.*

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III.—Meeting in Glasgow*

A meeting of the Society of Veterinary Practitioners was held in the Committee Room of the Concert Hall Building, Empire Exhibition, Glasgow, on Monday; September 5th, 1938, at 12.30 p.m.

Captain A. H. Watson of Thornbury was voted to the Chair, and there were also present: Captain J. S. Andrew, Mr. D. S. Brown, Captain C. W. Cartwright, Major A. N. Foster, Mr. W. Gardner, Major H. Gillmor, Colonel H. Greenfield, Mr. David Brown, Mr. T. R. Jarvie, Mr. S. Jennings, Captain W. W. Lang, Mr. Wm. Martin, Mr. G. Mayall, Mr. P. Meikle, Mr. C. T. Murphy, Captain J. W. Procter, Mr. Wm. J. Rice, Mr. W. L. Richardson, Mr. W. J. B. Robson, Captain G. Simons, Mr. R. M. Smith, Major A. Spreull, Captain J. F. Taylor, Mr. T. Wilkinson, Captain A. Young and Mr. T. A. R. Chipperfield (*Assistant Hon. Secretary*).

Messrs. A. J. Cattell, W. J. Rice and J. A. Symon was present as visitors.

Apologies for absence were received from Sir Frederick Hobday, Mr. H. W. Steele-Bodger, who sent a telegram of good wishes to the members, and Major A. B. Mattinson.

The venue and date of the Annual General Meeting were discussed, and on the proposal of Captain J. W. PROCTER, seconded by Major A. N. FOSTER, it was resolved that the Annual General Meeting be held in London on a date coinciding as near as possible to the next Council Meeting of the N.V.M.A.

The ASSISTANT HON. SECRETARY reminded members that the E. P. Edwards' Presentation Fund was not yet closed, and expressed the hope that those who had not made a donation would do so during the week.

He went on to outline certain aspects of the reorganisation of the Society which he considered desirable to increase the efficiency of the executive, the most important being that the Executive Committee be perpetuated and elected as a permanent body of the Society and meet in London as and when action demands for the purpose of formulating the policy of the Society.

He further suggested that the meetings of the Society be regularised on a quarterly basis and that the venue of these meetings should be so arranged that the country was covered within a period of two years, to enable members in the different areas to attend a meeting in their own locality. He felt this highly desirable owing to the fact that the present sporadic system of holding meetings led to a considerable dissipation of the energies of the Executive Officers of the Society and involved a considerable expense.

Captain PROCTER suggested that the Divisional Meetings should be utilised by members of the Society for the discussion of problems besetting them with a view to subsequent communication with the Society's Executive where further action was considered necessary. He suggested that in this manner, the S.V.P. would become a "House of Lords" to Regional Parliaments within the geographical areas created by the various Divisions.

After discussion, it was proposed by Captain A. YOUNG, and seconded by Major A. N. FOSTER, that the Executive Committee to be elected at the Annual General Meeting be responsible for the formulating of the policy of the Society.

Mr. S. JENNINGS considered that for the time being the Society's chief activities should be directed towards the safeguarding of the members in cattle practices.

In discussing the venue of the suggested quarterly Meetings of the Society, he urged that one meeting be held in Scotland yearly, to coincide with the Annual Meeting of the Scottish Branch. This proposition was seconded by Mr. R. M. SMITH. After further discussion on this point, Captain PROCTER, in voicing the opinion that the Executive Committee could be relied upon to give every part of the country a fair number of meetings, moved an amendment that the meeting places of the Society be decided by the Executive Committee. This was seconded

*Received for publication October 5th, 1938.

by Captain J. S. Andrew. The amendment was carried.

At this juncture the meeting was adjourned until Wednesday afternoon, when it was resumed in the Concert Hall of the Empire Exhibition at 3.20 p.m.

The members present were as follows: Captain A. H. Watson (in the Chair), Captain J. S. Andrew, Major F. W. Aston, Captain J. R. Barker, Mr. D. Brown, Mr. W. A. Campbell, Mr. J. Cochrane-Dyet, Mr. T. B. Fleming, Captain O. V. Gunning, Mr. T. C. Hall, Captain S. E. Hill, Captain H. Tudor Hughes, Mr. T. R. Jarvie, Mr. S. Jennings, Mr. A. Kerr, Mr. J. H. McGhee, Captain R. D. Mackintosh, Mr. J. Martin, Mr. G. Mayall, Mr. P. Meikle, Professor W. Mitchell, Mr. R. R. Moodie, Mr. G. M. G. Oliver, Mr. W. J. B. Robson, Captain C. F. Shawcross, Mr. R. M. Smith, Mr. R. Swaby, Mr. T. R. Thomas, Mr. C. Weighton, Mr. T. Wilkinson, Captain J. L. Williams, Mr. H. M. Wilson and Mr. T. A. R. Chipperfield. Visitors: Captain A. Barr, Mr. H. Graham, Mr. I. Hearder, Mr. N. H. Lambert, Mr. W. B. McAleer, Mr. D. R. Macrae, Mr. E. S. Paterson, Mr. J. D. Rankin, Mr. A. M. Sievwright and Mr. W. Woods.

The Chairman threw the meeting open for general discussion.

Major W. F. Aston raised the question of the difficulty of members out in the country attending the various meetings of the Society, and he suggested that in order to overcome this difficulty informal meetings of members in a locality could possibly be held either before or after the various Divisional Meetings to the advantage of all concerned. He proposed "That in areas covered by Divisions of the N.V.M.A., there shall be an informal organisation of the S.V.P with an organising secretary wherever practicable."

Captain Procter, in rising to second this motion, stated that it embodied all the ideas he had in mind, when discussing this subject at the recent meeting.

The motion was carried.

Captain J. R. Barker, in addressing the meeting from the platform, made some introductory remarks to the discussion upon the Centralised Veterinary Service. He suggested that the report of the Consultative Committee's work in the N.V.M.A. Handbook having been published, it was unnecessary for him to report the whole trend of affairs in detail, and intimated that he was prepared to answer any questions or comments put forward by members. He considered that the scheme was well founded although it was in its infancy and had resulted in many apparent and latent inequalities of sacrifice on the part of members. He, himself, viewed the future with optimism and was of the opinion that the vast amount of fresh work which would of necessity be created by the various Government schemes, would prove of the utmost benefit to the practitioner.

A discussion in which several members took part followed upon the scale of fees paid for the work done under the Ministry, and it was pointed out by Captain Barker that the scale of fees agreed upon in the negotiations with the Ministry although in no way comparable to the scale put forward by the "National," was the best that could be obtained.

Mr. G. Mayall asked of what use a Panel B appointment was to a man in a district where there were no attested or tuberculin-tested herds and queried the value of tuberculin-testing in "flying" herds.

Major Foster, when discussing the whole trend of events, feared the gradual loss of work and elimination of the general practitioner as the result of the enlargement of the whole-time staffs, which would leave agriculturalists bereft of any assistance in times of emergency when they required veterinary surgeons for foaling, calving and colic cases.

Professor Mitchell said that the demand for assistance had gradually increased in some districts, where single-handed practitioners had benefited by the volume of work under the Ministry and he was fearful lest in some areas the amount of such work would tend so to occupy the part-time inspector that the greater part of his clinical work would of necessity have to be made over to an assistant, which might tend to produce practitioners who were no more than unofficial Government servants and whose clinical experience would suffer from reduced opportunities for practising clinical art.

Mr. R. M. Smith felt that the work would so increase that even if all the students in the colleges to-day were qualified, there would be insufficient men to carry it out; he was in no way pessimistic concerning the future prospects facing the general practitioner.

Mr. McIntyre discussed the general situation and voiced the opinion that the salaries of the whole-time staff were too low, and that they should be increased.

Captain Barker replied to points raised by various members and the Assistant Hon. Secretary, in winding up the discussion, urged members most strongly to co-operate whole-heartedly with the Ministry and its staff by carrying out all work allotted to them efficiently and expeditiously, without paying too much attention to the amount of work done in relation to the maximum fees which the Ministry's scale enables the practitioner to earn in any one day.

The meeting then concluded.

T. A. R. Chipperfield, *Asst. Hon. Secretary.*

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Oct. 24th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

Oct. 24th.—Meeting of the N.V.M.A. Advisory Committee on Overseas Services, at 36, Gordon Square, W.C.1, 2.15 p.m.

Oct. 25th.—N.V.M.A. Committee Meetings, at 36, Gordon Square, W.C.1: Finance and General Purposes, 11 a.m.; Special Committee on Tuberculin Tests, 2.15 p.m.

Oct. 26th.—Meeting of the Section of Comparative Medicine of the Royal Society of Medicine, 1, Wimpole Street, W.1, 5 p.m.

Oct. 26th.—Meeting of the Western Counties Division, N.V.M.A., at Taunton, 2 p.m.

Oct. 28th.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.45 p.m.

Oct. 28th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds, 3 p.m.

Nov. 1st.—Meeting of Dumfries and Galloway Division, N.V.M.A., Station Hotel, Dumfries, 2 p.m.

Nov. 3rd.—Annual Dinner and Dance of the Central Division, N.V.M.A., at the May Fair Hotel, W.1.

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THE GLASGOW CONGRESS

Dr. Udall's "Impressions"

In response to the expression of our view that some account of his impressions of the "National" Congress at Glasgow would be of interest to members of the N.V.M.A., Dr. D. H. Udall, of Cornell University, whose paper to Congress is reproduced, with a report of the discussion, at the commencement of this issue, writes:

"First of all I have been impressed with the foresight and care given to the preparation of the programme. My invitation to speak was received about nine months before the date of the meeting; the final date for submission of copy was three months before this date, and the article was distributed to the members of the Association several weeks in advance of its presentation at Glasgow. Those assigned to the discussion had ample time and opportunity to prepare, and all who were interested could readily follow the subject.

"Secondly, I have been impressed by the fact that all papers were presented at the announced time and place, and that only one programme was presented at the same time.

"The series of daily social events from the "At Home" on Sunday evening to the "Veterinary Benevolent Dance" on Thursday, in addition to an entire day on a boat ride, might leave a suggestion that entertainment constitutes a major part of the programme. Whatever one may conclude on this point, its quality was one of refinement and charm, and its influence upon relations between different elements within the profession must be lasting and beneficial.

"Especially interesting was the honour paid to the Congress by the City Council of Glasgow. To be greeted in the receiving line by members of this Council, clothed in their official robes, was a unique experience. The magnificent Council Hall itself, with its ball room, concert hall, parlours and dining-rooms bespeak royal entertainment for visitors to the second city of the Empire. And the visitors from the Veterinary Congress were no exception."

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PERSONAL

Birth.—Macmaster.—At 12, Louie's Lane, Diss, Norfolk, on October 16th, to Louisa Sturgess (*née* Jones), the wife of Duncan B. Macmaster, M.R.C.V.S., a son.

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R.C.V.S. OBITUARY

Balcombe-Brown, Denis Roberts, B.A. (Oxon), M.R.C.S., L.R.C.P., B.M., B.Ch., c/o Bank of New Zealand, 1, Queen Victoria Street, London, E.C.4. Graduated London, December 20th, 1934. Died October 16th, 1938.

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Ewing, Samuel Hill, 482, Ridge Road, Durban, Natal, South Africa. Graduated Dublin, July 22nd, 1909. Died September 20th, 1938.

Mr. Ewing, in the year following his graduation, joined the Veterinary Division of the Union Department of Agriculture. During his period of service he had been stationed in many different centres in South Africa, but principally in Natal. Prior to his death he was stationed in Durban.

"Mr. Ewing was held in high esteem by the Department, as he had very sound and practical views of the multifarious problems which confront Departmental officers from time to time," says the *Natal Mercury*. "He endeared himself to his colleagues and staff, and his never-failing courtesy and genial manner greatly appealed to the members of the public with whom he came in contact."

The funeral took place at Stellawood Cemetery on September 21st and the veterinary profession was represented by Mr. S. T. A. Amos (President of the South African Veterinary Medical Association), Mr. W. A. Dykins (Director of the Municipal Abattoir), Mr. W. M. Power (member of Natal Executive Committee), Mr. A. M. Diesel (Senior Veterinary Officer for Natal), Col. A. F. Harber (Municipal Veterinary Officer), and Mr. C. H. Morris (representing Mr. W. E. Footner, Government Veterinary Officer, Durban, who was indisposed.)

Miller, John, Invercargill, New Zealand. Graduated Edinburgh, December 21st, 1894. Died September 20th, 1938.

Mr. Miller took a prominent part in the public life of his community, and for several years past has been Mayor of the City of Invercargill, a position he held at the time of his death.

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Turner, Philip, Ixworth, Suffolk. Graduated London, January 6th, 1882. Died October 13th, 1938, aged 78 years.

Mr. Philip Turner was the son of the late Mr. and Mrs. Turner, of Old Newton Hall, Stowmarket. After obtaining his diploma at an early age, and following a year as assistant, he went to reside at Ixworth in September, 1883, taking over the practice from Mr. Pizzy.

A keen sportsman, being very fond of shooting and hunting, Mr. Turner also took a great interest and a prominent part in the social life of the village. He was one of the founders of the Church Club and Reading Room and the Ixworth Bowls Club. For a time he was a school manager, and had been a sidesman at the parish church for a number of years.

Mr. Turner leaves a widow, three sons and five daughters.

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Wooley, Abraham, Oakfield, Kirriemuir, Angus. Graduated Glasgow, December 20th, 1898. Died October 17th, 1938, aged 68 years.

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FOOT-AND-MOUTH DISEASE

Outbreak in Kent

The existence of foot-and-mouth disease was confirmed on Saturday last among cattle at Benenden, Kent.

The area affected by the Order prohibiting the movement of animals, except by licence, lies in Kent and East Sussex.

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The Disease in Western Europe

According to an article in the monthly bulletin of the International Institute of Agriculture, in Rome, every country in Western Europe suffered more or less severely from the foot-and-mouth disease outbreak which began about the middle of 1937 and persisted until the middle of this year, and the disease is still spreading towards the east, the north, and the south-east of the Continent.

In the middle of 1938, Germany was the country where the infection was most widespread, and there were no signs of any slackening in its intensity there. In Belgium, Great Britain and Switzerland the decline has been fairly slow, with the constant appearance of new centres. A considerable increase has occurred in Germany, Poland and Czechoslovakia and the contagion reached Austria, Hungary, Sweden, Portugal and the Free City of Danzig.

In Denmark, the disease, thanks to the very strict measures adopted, in conjunction with Sweden, has been kept within narrow limits.

At the end of 1937 in France, 121,711 farms were infected. This was the peak period, although there have been many fresh outbreaks since May. By the end of February, 1938, over two million cattle, over a million sheep and goats and more than half a million pigs had been attacked and enormous financial losses, met to some extent by Government grants for compensation, have been incurred by farmers. In Belgium, too, seven million francs were voted for the compensation of farmers.

Losses of stock due to the disease in Holland between September, 1937, and June, 1938, were 10,553 animals in all. Switzerland, like the United Kingdom, succeeded in limiting the spread of the disease, and in Italy at the worst period of the outbreaks, no more than 1,013 farms were infected.

In Germany the full force of the epidemic was not felt until the middle of this year, when 138,446 farms were infected, out of 750,000 farms for the whole country. The losses at the end of February, even before the epidemic had reached its height, had represented 250 million marks.

All this throws into strong relief the relatively small figures of the United Kingdom. In 1937, 187 centres were affected and in the first half of 1938, 155. For the whole period about 50,000 animals were slaughtered, and the amount of compensation paid was about £250,000.

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Control Measures in South Africa

Precautionary measures on a large scale, to combat foot-and-mouth disease, have been agreed on by the Union Government and the Bechuanaland Protectorate authorities. The Union Government has accepted the invitation of the Bechuanaland Protectorate Government to send an expedition from the Union Veterinary Department into Bechuanaland to co-operate with the Protectorate Government's Veterinary Department in examining all cattle in the Protectorate.

"This will be a gigantic task," observes the *African World*, "but it is felt to be worth while in view of the losses suffered from the outbreak in Northern Natal which occurred in June. In that outbreak 14,599 head of cattle and 19,634 sheep were destroyed, and the total compensation paid was £50,479. Following that outbreak, it was suggested that steps should be taken by the Union Government to prevent the importation of cattle from Bechuanaland. In view of this, the Resident Commissioner for the Protectorate proposed to the High Commissioner that it was in the interests of all concerned that an examination of all stock in the Protectorate should be carried out by the two veterinary departments working in unison. All owners of stock in Bechuanaland have been invited to assist the officials in their work."

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Errata.—Major F. L. Gooch, F.R.C.V.S., of Stamford, Lincs., points out the following inaccuracies, which we regret, in our report of his address of acknowledgment of his election as an Honorary Member of the N.V.M.A. at the Annual General Meeting. On page 1310 of our issue of October 8th, column 1, paragraph 2, line 18, *for* "Shorthorn" *read* "Red-polled"; column 2, paragraph 1, line 8, *for* "Blake" *read* "Blakeway"; paragraph 2, line 4, *insert* "of the Council" after "member." Finally, Major Gooch has not occupied the position of President of the National Veterinary Benevolent and Mutual Defence Society, as stated in the report.

Attention is drawn to the following *errata* occurring in the editorial on "The Loveday Report: An Enlightened Compromise" published (pages 1404-1406) in our last issue: column 2, paragraph 3, line 1, *for* "judical" *read* "judicial"; column 3, paragraph 1, last line, *for*

"experients" *read* "expedients"; column 3, paragraph 2, line 6, *omit* "early" before "degradation"; column 4, line 5, *insert* "upon" after "enlarging."

* * * * *

Progress is being made in the eradication of tuberculosis in pigs, and certain leading breeders are endeavouring to free their herds of infection. The Agricultural Research Council at Compton, near Newbury, have been making special efforts in this respect. Since its formation no pig has been brought into the herd unless it had passed the tuberculin test. All pigs above weaning age have been tested with both bovine and avian tuberculin.—*The Times.*

* * * * *

At a Meeting of The Farmers' Club to be held at The Royal Empire Society (entrance in Craven Street, W.C.2, near Club), on Monday, October 31st, 1938, at 4 o'clock p.m., Mr. F. C. Minett, D.Sc., M.R.C.V.S., Director of the Research Institute in Animal Pathology, Royal Veterinary College, will read a paper on Bovine Mastitis. The discussion will be opened by Mr. W. J. Cumber and Mr. Clyde Higgs.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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TUBERCULIN TESTS

To the Editor of the Veterinary Record

Sir,—Definite diagnoses are given on the character of observed swellings; but how many of these diagnoses are supported by definite *post-mortem* findings? I have done many thousands of tests, of all sorts, in my time, and "glory be," my interpretations seem so far to have met with official approval, but I have very often longed to be in a position to verify these *post-mortem*: still quite often being not *so* sure myself.

The excellent paper by the Chief Veterinary Officer in the *Record* of September 24th gives many results of great interest and value, but how much more valuable they would have been if supported by *post-mortem* findings; how many delayed re-actors have been post-mortemed?

The results of the Ministry's promised further tests of delayed re-actors will be awaited with interest and may we hope these will be supported by *post-mortem* evidence?

Yours faithfully,

J. R. Baxter.

Downington House,
Lechlade, Glos.
October 13th, 1938.

GRAVITY FEED INTRAVENOUS APPARATUS

To the Editor of the Veterinary Record

Sir,—I would ask space to call attention to an admirable American-manufactured gravity feed intravenous apparatus which I encountered during a recent visit to Canada.

The apparatus consists of a flutter valve moulded into a pure India gum head which slips over the top of a bottle containing fluid for injection. The flutter valve admits air into the inverted bottle but effectively prevents the leakage of liquid. From the rubber head a tube leads to the intravenous needle. The rate of flow is readily controlled by elevating or lowering the bottle in relation to the vein.

The small outfit seems to me to be a simple but invaluable article. It is manufactured by the Norden Laboratories, Lincoln, Nebraska, under the name of the "Simplex Intravenous Outfit," price $1·25.

Yours faithfully,

Edward F. Peck,
Chief Veterinary and Agricultural Officer.

Burao,
September 19th, 1938.

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TRACE ELEMENTS: THE SPECTROSCOPIC WORK OF RAMAGE

To the Editor of the Veterinary Record

Sir,—I have read with some interest the various articles on so-called "trace elements" essential to healthy animal life, in a recent number of the *Record*.

Although a number of workers' names were mentioned I failed to find the name of Ramage. I think that it would not be right to omit his name in connection with these investigations, as it was mainly through him that modern spectroscopic work used for detection of the rarer metallic elements was first disclosed.

The range of his spectroscopic work included plants and animals, and has covered a period of nearly 36 years. A full report of his life work appears in the issue of *Nature*, May 28th, 1938, which concludes with: "he represented the noblest type of the scientific spirit."

It was only after soils from New Zealand were submitted to him that cobalt was discovered in the case of the Morton Mains sheep disease to be the causal deficiency. During his investigations of the mineral contents of plants, Ramage was able to isolate quite respectable-sized pellets of silver and copper from half a pound of dried ordinary edible mushrooms. He also discovered the metal barium as being a constant element in the structure of the eye, strontium in the genital duct of snails; manganese in the liver, etc., etc.

Unfortunately he died early this year without completing various problems he was engaged in.

Yours faithfully,

William S. Stevens.

c/o Glyn, Mills & Co.,
Whitehall, London, S.W.1.
October 17th, 1938.

CASTRATION BY CORD-CRUSHING TECHNIQUE

To the Editor of the Veterinary Record

Sir,—The *Record* dated September 17th is of special interest to me, as at last we have a reply to Lieut.-Colonel O'Rorke's letter on castration by the adoption of cord-crushing technique and an address by Mr. Saunders on "The Problem of Cruelty to Animals." Both these subjects go well together, as the former is a method of castration that causes excessive pain for a prolonged period—in some cases three months.

I take it that the idea of crushing the spermatic cord is a modification of the old Indian method of crushing the testicles, by placing them on a flat stone and pounding them with a wooden mallet. I think Mr. Saunders should have included this method of castration in his list. At present, as far as I know, this technique is taught in our veterinary colleges and is recommended for castration of calves and lambs. The result is, that a considerable number of farmers have their own instrument, not only castrating their own calves and lambs but lending it to every Tom, Dick and Harry. In my opinion the veterinary profession, by employing the cord-crushing method, has encouraged quackery and the idea of every farmer being his own veterinary surgeon.

In the horse so castrated, if any nodule remains in the scrotum, or if there is any thickness of the spermatic cord, the animal must be considered unsound.

Is it not time the profession considered fully the question of the use of this technique under the heading of cruelty to animals? A veterinary surgeon who is in the habit of castrating calves—especially wild calves that have been reared on cows—will castrate faster with the emasculator and knife than will the expert in the technique in question.

I expected that some of the teachers in our colleges would have replied to Lieut.-Colonel O'Rorke's letter and not have left it to men on foreign service to reply.

Yours faithfully,

W. A. Smith.

Oaklands,
Boyle.

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ACTINOMYCOSIS

To the Editor of the Veterinary Record

Sir,—Your review of a monograph on this well-known bovine disease prompts me to enquire if in its treatment any colleagues have tried the effect of an intravenous injection of sodium iodide (one ounce) in 500 c.c. of distilled water. It is claimed that only severe cases require more than one or two injections (seven-day interval) and the method appears preferable to the common, rather prolonged, and not invariably successful medicinal treatment with large doses of potassium iodide.

Yours faithfully,

J. F. D. Tutt, F.R.C.V.S.

"Rothiemurchus,"
St. Cross,
Winchester.

DISEASES OF ANIMALS ACTS, 1894 to 1937, and AGRICULTURE ACT of 1937 (PART IV)

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 30th Sept., 1938	29	30	—	—	2	2	5	35	22
Corresponding period in									
1937	21	21	—	—	3	3	—	31	29
1936	9	9	—	—	5	5	—	64	45
1935	11	14	6	512	2	2	6	101	60
Total 1st January to 30th Sept., 1938	628	984	162	20,545	44	74	125	530	385
Corresponding period in									
1937	530	637	20	4,919	99	137	139	799	497
1936	338	398	5	448	96	238	167	1,460	1,040
1935	261	307	40	10,720	86	172	269	1,478	874

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.* herds officially certified as free from tuberculosis as at 30th September, 1938, was as follows:— England 968 ... Wales 1,705 ... Scotland 935 ... Total (Great Britain) 3,608